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Recreational indicators in the Danish National Forest Inventory

experiences and results

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Published in:
The 7th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas (MMV)

Publication date:
2014

Document version
Early version, also known as pre-print

Citation for published version (APA):
Jensen, F. S., Nord-Larsen, T., Johannsen, V. K., & Skov-Petersen, H. (2014). Recreational indicators in the Danish National Forest Inventory: experiences and results . In M. Reimann, K. Sepp, E. Pärna, & R. Tuula (Eds.), *The 7th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas (MMV): Local Community and Outdoor Recreation, August 20-23, 2014 Tallinn, Estonia* (pp. 138-139) http://www.tlu.ee/UserFiles/Konverentsikeskus/MMV7/MMV%20PROCEEDING.pdf

Download date: 05. May. 2023

The 7th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas (MMV)

Local Community and Outdoor Recreation

August 20 - 23, 2014
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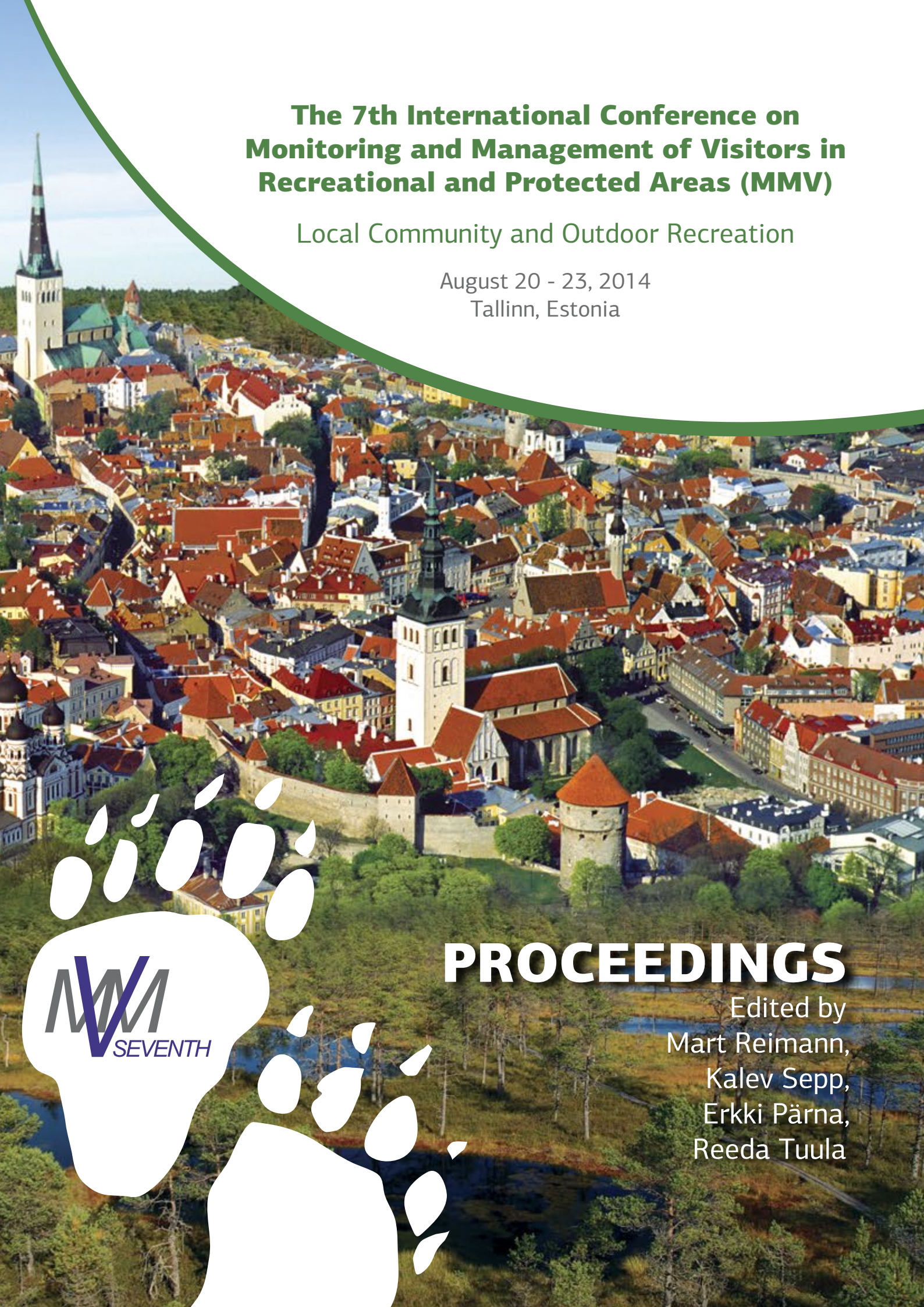

PROCEEDINGS

Edited by
Mart Reimann,
Kalev Sepp,
Erkki Pärna,
Reeda Tuula

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ISBN 978-9949-29-162-5 (trükis)
ISBN 978-9949-29-166-3 (pdf)

Introduction

The seventh conference on Monitoring and Management of Visitors in Recreational and Protected Areas (MMV) takes place in Tallinn at Tallinn University in vicinity of old town listed in UNESCO World Heritage list. This publication is a collection of extended abstracts from three keynotes, 116 oral and 16 poster presentations. Every paper in this proceeding has been reviewed by the International Steering Committee.

The main theme of the conference is Outdoor Recreation and Local Community. Involvement of local communities into recreational planning process, especially inside protected areas, is getting more and more relevant globally. In Estonia a human has never opposed to the nature which has always been our refuge from all the conquerors, a human is rather considered as a part of nature. There are local communities in all our national parks and in majority of other protected areas. Despite its small size Estonia has lot of wilderness and Estonians are used to live together with wilderness and wildlife. Our large carnivores (wolves, lynxes, brown bear) concentration is high, but it never caused a big public debate because the Estonians' tolerance is high. Estonia has 18.4 % of the terrestrial territory under the nature protection. The MMV conference offers good opportunity to share Estonian experience in working with local communities on recreation planning and management.

The MMV conference provides a forum for presentations and other exchanges of ideas and experiences related to the monitoring and management of visitors in recreation and protected areas. The emphasis is on policies, problems, practices and innovative solutions, and will therefore be of equal relevance to managers and researchers. The conference welcomes researchers, public sector and industry managers, consultants, planners and members of NGOs dealing with visitor management in recreational and protected areas. The first MMV conference was held in Vienna, Austria in 2002 followed by meetings in Rovaniemi, Finland 2004, Rapperswil, Switzerland 2006, Montecatini Terme, Italy 2008, Wageningen, the Netherlands 2010 and Stockholm, Sweden 2012.

The organizing consortium of the four Estonian universities (Tallinn University, University of Tartu, Tallinn University of Technology and Estonian University of Life Sciences) has managed to organize the diverse conference program. Additionally to the main program with the help of Estonian State forest management centre and Kuusalu municipality excursions to Lahemaa National Park and performance by the local communities are organized, which are very closely related to the main topics in the conference. The conference covers a broad range of topics from the local communities and visitor management to the trends in outdoor recreation. If compared to previous conferences, the larger discussion about the local communities is expected in this conference and the coverage of risk management issues, which is following the global trend of higher concern of the seafety in outoor recreation.

Mart Reimann
Kalev Sepp

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KEYNOTE SPEAKERS

Mobile positioning as an innovative tool in visitor management and monitoring

Rein Ahas, University of Tartu, Estonia, rein.ahas@ut.ee

Tourism has become one of the world's leading industries and an integral part of people's lives today. The increase in the importance of tourism sector has been accompanied by changing of tourism itself. There is increasingly less "classical" tourism and tourists that are defined by one activity or one destination (Framke 2002; Esu & Ebitu 2010). More and more people travel for several purposes, the purposes are often interwoven. Researchers have admitted that tourists increasingly find it hard to determine the reason for their visit in surveys – there are several of them. For example, business tourists are often very important consumers of traditional attractions and services. They have money for taking part in expensive attractions and eating in exotic restaurants. Also, one of the important factors influencing the motivation of conference tourists for participation is often "visiting friends and relatives", i.e. "VFR tourism" (Breen, *et al*. 2001; Brida *et al* 2013). The reason for this, however, is today's transnational lifestyle – people's social networks are globally diffused and possibilities for visiting loved ones are taken into account when contemplating travelling decisions. Changes in tourism have been accompanied by an increase in spending nights at non-traditional accommodation establishments as well as changes in the spectrum of services. The changing of tourism today leads to the need for new types of tourism statistics, because traditional statistics cannot measure and understand this new and mobile society and tourism to the full extent (Buhalis 2000; Crompton & Mackay 1994; Nilbe *et al* 2014).

The aim of this presentation is to introduce the possibilities for using mobile positioning-based statistics in measuring and studying tourism. Mobile positioning-based tourism statistics have been used in tourism at least since 2004 in Estonia (Ahas & Mark 2005). The databases of Mobile Network Operators (MNO) make it quite easy to compile statistics on which countries the "roaming" phones that have visited a destination are registered in, how long they stayed at the destination, and which places they have visited. This is also called passive mobile positioning data, because there is no special inquiry made to find the visitors, but information already recorded by the operator is used instead (Ahas *et al* 2008). Since there is a huge amount of data, it can also be called BIG data. Mobile positioning data are, however, not "almighty", there are several shortcomings. But they do enable to solve some important problems in measurement and scientific research of tourism. Next, I am going to present some of the most important aspects.

First, mobile data enables to obtain information about mobility of people and tourism in the world with open borders. Due to opening of borders, border-crossing statistics are no longer collected in many regions of the world, including European Union countries. Thus, a very reliable tourism statistic has been lost. Passive mobile positioning enables to document the visits of people (phones) from all other countries easily and accurately.

Second, mobile data enable to obtain more information about foreign visits than traditional accommodation statistics. Today's tourism is diverse and there are more and more one-day-visits, transit, and alternative forms of accommodation (e.g. VFR, nature tourism). These are not reflected in accommodation statistics, but leave a trace in mobile databases.

Third, many tourism statistics methods were developed "in the middle of the last century". Also, the WTO and EU definitions phrased in the middle of the last century do not enable to measure all aspects of today's vital and virtual tourism contextually.

Fourth, however, mobile data have significant benefits arising from their digital nature: a) they make data collection and processing large amounts of data easy; b) enable to collect data longitudinally, i.e. once permits have been obtained and software developed, statistics can be collected in the course of a long period of time, which makes it possible to study people's travelling behaviour completely differently than it has been studied so far (Roorda & Ruiz 2008; Schönfelder & Axhausen 2004); c) the data are more geographically accurate, which enable to see the movements of tourists at the destination and differentiate the behavioural patterns of different visitor segments.

Fifth, the data are behavioural, i.e. the actual visits and presence of visitors is registered, not people's preferences or desire to travel somewhere. Studying tourism, which can be characterised by a complex deliberation process, researchers have stressed the need to base studies more on the behavioural data that register actual visits (Oppermann 2000).

Sixth, information and communication technology (ICT) based mobile data enable to connect traditional mobility studies of tourists with the virtual aspects of tourism. Increasing amounts of tourism-related information and transactions occur in computers and smartphones. Studying virtual tourism is the frontier of today's studies.

Yet, mobile data are not almighty. The first important shortcoming of mobile data is the complexity of access to the data. It is influenced by privacy and data protection regulations, the attitude of the public, and the issue of the business secret of mobile operators. For example, the Eurostat feasibility study (Positium LBS 2014) shows that, in 2014, the only European Union countries to use mobile data as tourism statistics were Estonia, Czech Republic, and Holland. France, Portugal, Spain, Austria, and Ireland have started to use the data. In 2014, further 8 EU countries expressed interest in and initiative for obtaining the data, using such data will probably become "common" in the course of the next 5 years.

Second, mobile data are dependent on the use of phones. Different societies and visitor segments use mobile phones to various extents and these differences must be taken into account. This requires comparison and development of traditional data and new types of data.

Third, digital mobile data contain various "new types" of data errors. For example, mobile networks reach over state borders and the phones located in the vicinity can show that one is in the neighbouring country without an actual visit. The technical specifications of the mobile phones used in different regions are also different; certain types of phones have no signal in some regions (older CDMA phones in Europe) or leave disproportionate traces of visits due to differences between contracts. For example, the availability and quality of mobile data are significantly influenced by whether data roaming is switched on or off when travelling, which in turn depends on the price of the service.

Therefore, I will be introducing the important concepts of destination marketing and the possibilities for using the statistics generated on the basis of mobile data by realising those (Kuusik *et al* 2011).

In the era of BIG data, there are also significant changes occurring in marketing due to the new possibilities of the "new" and digital data. I would like to highlight three aspects here. First, the data are in digital form, which makes the collection and processing of the data faster and analysis of the data more varied. Second, there is a lot of data, which changes the vertical and horizontal grounds supporting the analyses. Third, the collection of the digital and voluminous BIG data is automatic and fast, which enables to develop new types of marketing analyses and products. The actual benefits of BIG data in marketing are, however, developing along with applications in social media and communication networks. The new data are naturally also accompanied by various methodological problems.

Yet, there are several important developments in the measurement and scientific research of tourism occurring due to the new type of ICT-based tourism data (passive mobile positioning, photo sharing, internet use, etc.). I will be describing some interesting approaches here.

With respect to collection of statistics, there have been "automatic" data collection systems developed, which enable to obtain quick overviews of visitors on the basis of the roaming data of a Mobile Network Operator. An important keyword here is "timeliness". Border crossing surveys and accommodation statistics arrive on the desks of researchers, marketers, or the industry very slowly, it usually takes more than 3 months, in the case of the transportation census, however, more than a year. The data obtained so "late" is of no use to many end-users (e.g. the industry, management) and thus the data is not used very much. Mobile data that arrive in real time, however, become useable for the industry and administrators in making daily decisions. The Eurostat Feasibility study showed that several groups of consumers agree to use the data if they enable to direct marketing operatively. The same applies to directing tourism on the national level. Such digital and automatically obtained data enable to develop automatic monitoring systems and other similar tools (Tiru *et al*. 2010).

Second, the greater-than-before temporal and geographical accuracy of tourism statistics (there are more points about a person's movement) makes it possible to thoroughly study movements at the destination, visiting of attractions, and much more (Saraniemi & Kylanen, 2011). Much more detailed segmentation of visitors and destination management will also be possible. Earlier statistics were mainly "black box"-type – we were quite well aware of entries to and exits from a country, but knew much less about what happened to the tourists inside the black box.

Third, longitudinal data (we are aware of the visits and behaviour of one person in the course of a longer period of time) make it possible to start studying various aspects of the behaviour of visitors – destination loyalty, changing of preferences in time, relationship between domestic and foreign tourism (Buttle 2004; Dick & Basu 1994; Morais & Lin 2010). Longitudinal data enable to find causal relationships between a person, institutions, and environmental factors better than before. One example that can be given here is studying the relationships between longitudinal behavioural data and genetic information in the field of tourism.

Fourth, the existence of more accurate and longitudinal data enables to start looking for new approaches to some classic tourism statistics issues. How to define and measure transit? How to measure the "usual environment", which is essential from the perspective of domestic tourism? What options are there for narrower defining of a destination (destinations in destination)? What are the thresholds of determining destination loyalty?

Conclusively, it can be said that the world has changed, tourism has changed, and studying tourism has changed. All new and interesting approaches to studying tourism require attention and careful methodological evaluation. There is no one universal and "almighty" database or method. All data and methods need to be evaluated critically and used in the right form. Here, we can pose three questions regarding mobile data:

a) To what extent they enable replacement of traditional statistics?
b) To what extent they enable complementation of traditional statistics?
c) To what extent they provide new information about the "new forms" of tourism?

Our Estonian experience of mobile positioning-based studies is the only one of the approaches. I would also like to mention the most important publications for getting acquainted with this subject.

Taking new data into use is naturally also accompanied by the need to evaluate the corresponding methods and the feasibility of the data. The Eurostat Feasibility study concluded in 2014 is one step towards developing new solutions. New and digitalised data are also accompanied by the need to address the issues of privacy and data protection, which arise more sharply here.

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World Heritage and sustainable tourism challenges and current approaches

Peter Debrine, Executive Director of the World Heritage Alliance

World Heritage sites are unique treasures of humanity. These natural and cultural wonders have outstanding universal value, represent our past and present, and belong to all. These sites are also important travel destinations with huge potential impact for local economic development and long-term sustainability.

Travel and tourism is one of the largest industries and heritage tourism is its most rapidly growing international sector. With millions of tourists visiting World Heritage sites each year, tourism has become an important cross cutting issue and management concern at most World Heritage sites.

The UNESCO World Heritage Centre has developed the World Heritage and Sustainable Tourism Programme (UNESCO WH + ST) to catalyse positive change to protect and conserve the sites while enriching the lives of local communities at the same time enhancing the experience of travellers.

If undertaken responsibly, tourism can be a positive force for local community development and a vehicle for conservation and environmental protection. But if unplanned, tourism can be socially, culturally and economically disruptive, and have a devastating effect on fragile environments.

For the stakeholders implementing the global strategy of the World Heritage Convention, the overarching goal is the protection of cultural and natural heritage of outstanding universal value. It is also the fact that this natural and cultural heritage provides the assets needed for tourism development and the accrued benefits for the local communities. Therefore in order to achieve economic, environmental and social sustainability, the natural and cultural assets must be valued and protected and appropriate tourism developed.

At an operational level, there are a number of critical factors, which need to be addressed to foster sustainable tourism at a World Heritage property. This includes understanding the context, planning and development, management and monitoring, compliance and resources.

World Heritage is defined by its Outstanding Universal Values (OUV). Tourism to World Heritage properties represents an opportunity for sustainable development. However, if not well managed tourism may negatively impact the OUV and hence threaten our global heritage belonging to this and future generations.

Addressing unsustainable tourism and promoting sustainability requires a sophisticated, multi-layered and coordinated approach. The mechanisms of the World Heritage Convention, as outlined in the Operational Guidelines, represent a strategic advantage. The mechanisms relate to the nomination and inscription of World Heritage properties, their management, monitoring and evaluation, reporting as well as support and financial assistance. There are opportunities to strengthen the mechanisms of the Convention in terms of attention to tourism and for the new programme to assess potential impact on OUV from tourism and whether adequate management arrangements are in place. Although the mechanisms primarily focus at site level they can also inform the enabling environment providing the overall policy and regulatory framework as well as the institutional and funding arrangements.

While activities at site level may achieve specific results, they can also be very resource intensive and risk being undermined by a weak enabling environment. On the other hand, opportunities to influence the enabling environment may be complex but can have significant impact and present a more strategic approach for the new programme on World Heritage and

Sustainable Tourism.

However, there are significant challenges for UNESCO to respond effectively. The number and diversity of World Heritage properties, the complexity of the tourism industry, capacity needs and conflicting incentives across a range of stakeholders may lead to the prioritization of short-term gains at the cost of sustainability. Furthermore, resources available to the Programme and its partners may at best be modest in relation to the scale of the challenge.

UNESCO is advocating a strategic approaches that:

- Integrate a sustainable tourism perspective into the mechanisms of the World Heritage Convention.
- Strengthen the enabling environment by advocating policies and frameworks that support sustainable tourism as an important vehicle for managing cultural and natural heritage of Outstanding Universal Value.
- Promote broad stakeholder engagement in the planning, development and management of sustainable tourism that follows a destination approach and focuses on empowering local communities.
- Provide World Heritage stakeholders with the capacity and the tools to manage tourism efficiently, responsibly and sustainably based on the local context and needs.
- Promote quality authentic tourism products and services that encourage responsible behaviour among all stakeholders and foster understanding and appreciation of the concept of Outstanding Universal Value and protection of World Heritage.

Willingness of local residents to participate in protected area enhancement in the urban/rural fringe: harnessing the potential of enlightened mass tourism

David Weaver, Griffith University, Australia, d.weaver@griffith.edu.au

High order protected areas are increasingly essential mechanisms for preserving biodiversity, but reductions in government funding for public protected areas are leading to growing reliance on visitor-based revenue (Bushell & Eagles, 2007). This reliance, however, is problematic with regard to the negative impacts associated with increasing numbers of park visitors. As described by Budowski (1976), the relationship between protected areas and visitors is most often characterised by *conflict* or *coexistence*, and the ideal of *symbiosis* is still seldom encountered. Yet, there is much to be gained by repositioning the relationship as an *opportunity* rather than inherent threat. This could be represented by the visitor who participates in the on-site removal of exotic weeds and in turn receives personal physical, psychological and social benefits. It is likely, however, that visitors are extremely diverse in terms of their willingness to participate in various site-enhancement activities, and any efforts to promote park-visitor symbiosis through the establishment of an ecotourium strategy (Fennell & Weaver, 2005) must identify these diverse proclivities.

To this effect, domestic visitors to the IUCN Category II Lamington and Springbrook National Parks, in the hinterland of Australia's Gold Coast, were asked to assess their willingness to participate in 20 hypothetical activities, both on-site and off-site, that could help to enhance the park's biodiversity (Weaver, 2013). These parks are especially important because of their pristine sub-tropical rainforest habitat, which occupy only 0.3% of Australia but accommodate 60% of Australia's endemic plant species and one-third of its bird and mammal species. Attendant threats such as invasions of exotic vegetation and over-visitation are exacerbated by the proximity (one hour's drive) of Lamington and Springbrook to the 2.5 million residents of the Southeast Queensland urban agglomeration.

From mid-2010 to mid-2012, 804 valid questionnaires were received, of which almost three-quarters came from local residents of greater Brisbane and Gold Coast. Cluster analysis of the responses to the 20 hypothetical activities revealed the expected variability in proclivity, with segments ranging in from the *enthused* and *incidentally enthused* (20%) to the non-supportive *incidentals* and *disengaged* (43%). The former, as expected, were the only group enthusiastic about traditional on-site volunteering activities ("focused activism") such as weed removal and participating in research projects. Local residents were disproportionately represented in this group. Most visitors, however, were willing to engage in "incidental activism" involving the opportunistic removal of litter while hiking and reporting unusual activity to rangers.

The results attest to the potential of residents to function as an opportunity to enhance the biodiversity of local protected areas. However, because enthusiasm for focused activism is evident only among a small minority of visitors, it appears as if incidental activism is a much more effective way of involving "average" local residents who otherwise exhibit barriers to participation in more intensive activity. This can then be used as a basis for fostering higher levels of involvement, especially among younger residents who were under-represented in the sample and indicate increased alienation from the natural environment. The results also indicate that egotistical motivations such as "having fun" are just as important as or more important than altruistic motivations such as "making a difference". Ecotourium strategies, therefore, need to engage individual preferences and needs. A major implication of the research is that almost all visitor-residents have the potential to participate in at least some form of site enhancement, and that this embodies an aspirational model of "enlightened mass tourism" in which the assets of mass tourism (and in particular economies of scale) are selectively combined with the assets of alternative tourism (in particular ethical imperatives and compassion) to realise the elusive ideal of park-visitor symbiosis (Weaver, 2014).

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SESSION 1A PROFILING VISITORS

The nature of nature tourists in Bwindi Forest Uganda

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Visitors to the gorilla-tracking site in Ruhija, Bwindi Impenetrable National Park in Uganda were interviewed and observed in order to understand their level of leisure specialization, and the importance of nature to their Bwindi experience as well as in their home lives. Forty-seven visitors participated in the study over the course of a one-month field season. Findings revealed insights challenging eco-tourists as specialists with the exception of birders, and provide initial guidance relevant to Uganda's tourism product development and marketing.

Introduction

As ever increasing numbers of people travel to view nature and wildlife in distant and exotic lands, for over a decade nature tourists have been noted as one of the fastest growing segments of the leisure travel market (Weaver & Lawton, 2002). In response to the ever greater numbers of travellers seeking opportunities to observe and experience nature as an important part of their leisure (and business) travel, many developing nations, and African ones in particular, are embracing tourism to showcase their unique nature as a means of accelerating economic development. That nature tourism also promotes conservation goals is viewed as an added benefit. Like many other African countries, Uganda has identified nature tourists (and ecotourists in particular) as a receptive market for its tourism products and views the mountain gorilla as a key actor in these efforts, and as a result focuses much of its marketing efforts towards this market. Ecotourists in this context are seen as highly specialized nature tourists whose involvement in the attributes of nature tourism form an important part of their day to day lives (Lee and Scott, 2013). Sustainable community based tourism has been identified by the Government of Uganda as a solution to reducing poverty, enhancing rural livelihoods and its related problems: encroachment in protected areas, deforestation, poaching of wildlife, and attendant environmental degradation. However, Uganda's ability to identify and monitor visitors to the country and their motivations for doing so is seriously limited and has the potential to undermine the growing tourism in the country (Campbell *et al*, 2011, Government of Uganda, 2013). Understanding who the current tourists are, and what drives their decisions to visit Uganda are key to sustaining this important industry. It is often thought that nature tourists and ecotourists are highly specialized; however, often what constitutes "ecotourism" in the market is no more than an additional offering of other more generalized forms of tourism. In light of this possibility and the importance of effective, sustainable tourism development for Uganda, we sought to examine the degree of nature specialization of tourists tracking Mountain Gorillas (*Gorilla Gorilla Berengei*) in Bwindi Impenetrable Forest National Park.

Method and Study Area

Ruhija is a community of approximately 1200 people located on the border of Bwindi Impenetrable Forest National Park, which is located in Western Uganda bordering the Democratic Republic of Congo. The park is home to approximately 324 free ranging Mountain Gorillas. At the time the research was conducted (2011), two of eight habituated gorilla groups (habituated for tourism) were located in the Ruhija area. In addition to being the muster point for gorilla tourists visiting the Bitukura and Orozogo gorilla groups, Ruhija is a premier Uganda destination for bird watchers, and a partner community in a six-year CIDA-funded project linking conservation, community economic development and higher education. It is also the newest location for gorilla tracking in Uganda.

From August 15 to September 15 2011, all gorilla trackers (i.e., tourists) reporting at the muster point were approached each morning between X date and Y date and asked if they would be willing to participate in the study later that day. Those that indicated they were not staying in Ruhija were not included in the study numbers. Those who indicated a desire to participate were then met either at their accommodation or at the muster site after they had completed their track. The interview guide consisted of a series of open-ended questions eliciting information on the respondents' leisure specialization (Bryan, 1977) and image of Ruhija and Bwindi as destinations.

Results

In total 54 trackers participated in the interviews. Ten trackers declined to be interviewed and an additional 28 did not participate, as they were unable to arrange a meeting at a time convenient to them. Participants were highly international in origin with 37 from Europe, six from North America, five from Israel, four from Australia/new Zealand. Three were currently living in Uganda but were originally from elsewhere.

A thematic content analysis using open and structured coding provides the basis for the findings. Elements assessed to determine specialization were centrality of interest in nature to their overall life as indicated by level of participation at home, equipment, principle goal of the trip, amount and importance of past nature travel, degree of preparation (guidebooks, skills acquisition, training), and journaling (Lee and Scott, 2013). Saturation occurred very early in the study.

While nearly all respondents indicated that they occasionally watched nature and wildlife at home it was largely described as "accidental or circumstantial". Supplementing this was the result that only a few respondents regularly subscribed to "Nature" magazines or belonged to nature organizations. Indeed only the birders identified all these as important components of their leisure at home. Additionally birders often engaged in journaling about their nature experience and volunteered as citizen scientists. Non-birders, in contrast frequently described their gorilla tracking as a "one-off" or unique part of a more generally "relaxing" activity or something to "share with friends".

Conclusions and recommendations

Overall, the results of this study indicate that gorilla trackers in Bwindi are not serious ecotourists. With the exception of the four birders interviewed, participants are best described as "active adventurers" and "circumstantial nature tourists". When considered in light of other information regarding visitors to Uganda which suggests that over 50% of visitors are volunteers and less than 50% of volunteers visit Bwindi (Haloway *et al*, 2012,) Uganda appears to have misread its tourist market and could do much to either provide experiences to match those currently visiting or better attract a more specialized nature tourist.

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Visitor structure in the Kellerwald-Edersee National Park (Hesse, Germany)

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The Kellerwald-Edersee National Park (KW-ES-NLP) founded in 2004 is one of the youngest National Parks in Germany. One of the goals is to offer the possibility for calm recreation and education without harming flora and fauna. Therefore the KW-ES-NLP administration needs to know which kinds of recreation are performed within the area. To answer this question, the administration of the National Park and the Dept. Nature Conservation & Landscape planning implemented a first visitor monitoring approach in 2013.

Kellerwald-Edersee National Park

Description of the National Park

The extent of the KW-ES-NLP is 5724ha. 1.467ha are part of the UNSECO WORLD NATURAL HERITAGE "Ancient Beech Forests of Germany". The area has a long tradition with different kinds of usage and protection (hunting area for the sovereign of Waldeck, Wildlife Reserve and at last Forest Reserve). According to this history, there are disturbance sensitive species in that area, e.g. black stork (Ciconia nigra) and different kind of bats. In the whole area, visitors have to stay on the paths.

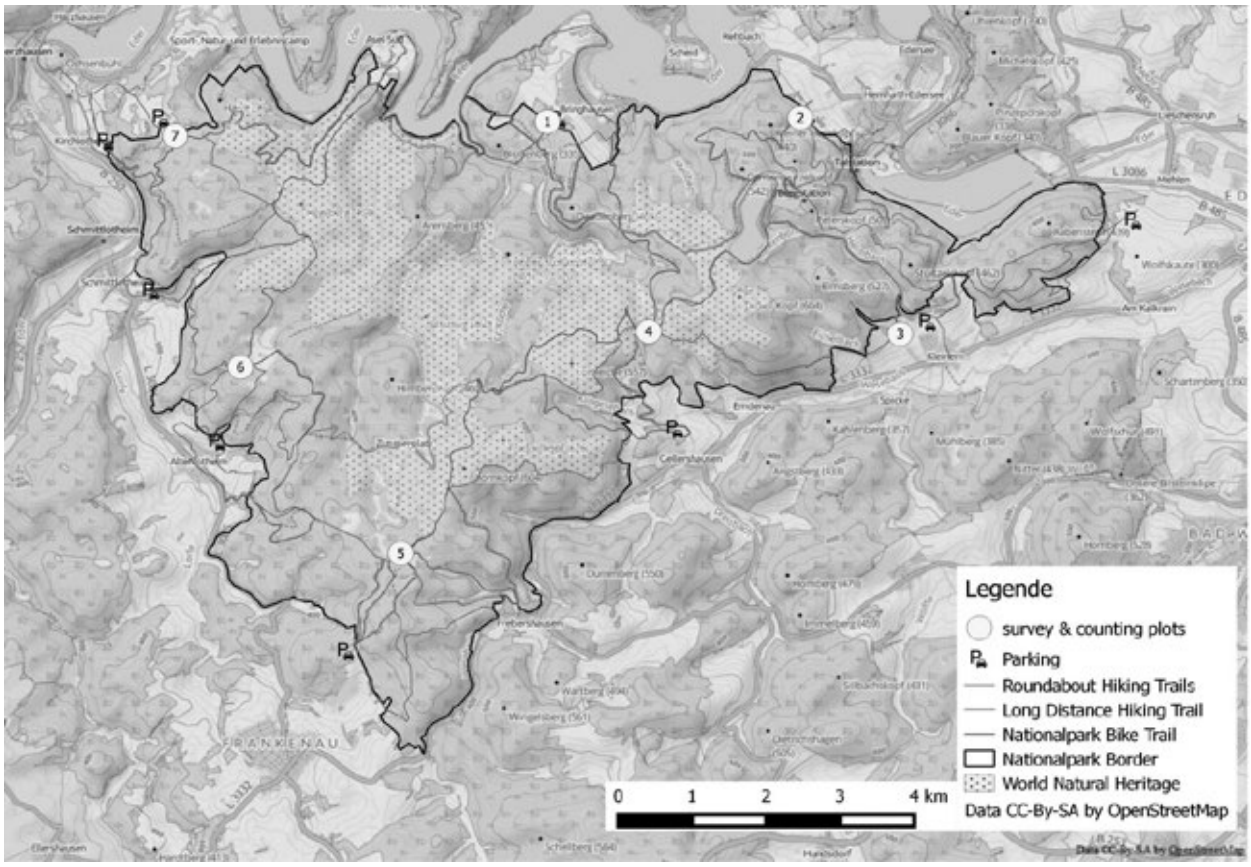

Fig. 1: Kellerwald-Edersee National Park. Survey Plots and overview of the roundabout hiking trails and bicycle trails

The north of the park borders to the Edersee which is an attraction for fisherman, sailors and other forms of water recreation. There are 10 Parking lots directed to the park, 20 roundabout hiking trails, 7 long distance hiking trails, one National Park Bike-Trail and one bike-trail, which touches the park on the shores of the Edersee.

Method

The KW-ES-NLP has multiple entrances, which made it impossible to observe every one of them. Therefore 7 points were chosen with the goal of registering most of the visitors. These survey and counting places were at entrances with a considerable number of trails crossing or starting at them (Fig. 1: Points 1, 2, 3) and at crossings inside the area with importance for connection or near points of interests (Fig. 1:4, 5, 6, 7). At these points the observers counted hikers

(promenaders & hikers), runners, bicyclist, equestrians and coaches (number of coach-guests). Also they counted the number of dogs which are calculated one dog on x-visitors. At the same time the observers carried out a survey. To conduct these two approaches with one person the counting has to be easy so that a more distinguished form of counting was not applied.

The research design was planned as four dates in low season 1 (15.03.2013-14.06.2013) but it was shortened 2 days due to bad weather in spring. 8 dates in the main season (15.06.2013-14.09.2014) and first planned four days in low season 2 (15.09.2013-14.11.2013), which was extended about two days missed in spring. In consultation with the park administration the winter season was not included in the monitoring process.

Results

6.394 people were counted. The yearly percentage of recreation forms shows that there are 79.3% hikers, 15.2% cyclists, 3.7% coach-guests, 1.2 % runners and 0.5% equestrians. Over all seasons the group of hikers constitutes the biggest fraction of recreation forms. The ranking for every season over all places is the same as over the year. But an examination of the places shows that there are differences in the distribution of recreational usage. The points 4 & 6 in Fig.1 show a change in usage over the different seasons. In low season 1 the hikers were the biggest fraction (4: 32.4% & 6:35.2%), this changed into the bicyclists in the main season where they had 74.5% (4) and 48.1% (6). At point 6 also the percentage of coach-guests were high in the low seasons and reduced in the main season. The ranking of the recreation forms in sum over all counting places over all seasons did not change. But one point was obvious that in the main season the percentage of bicyclists increased. Runners and equestrians appeared only in small percentages.

The number of people per dog, which is an indicator of the conflict parameter 'disturbance through dogs', was highest at point 4. For example 25 dogs per 372 visitors were counted at this place, which says that you can meet 14.8 persons and then you meet one dog at that place. Point 6 with 7.4% came at the second place. Point 3, which is a place near the village, is at the end of the ranking. Here you meet 2.4 persons and then a dog.

Conclusions

The results show that most visitors are hikers. In seasons overall, the ranking of recreation forms did not change, except for an increase of about 10% of bicyclists in the summer. A comparison of the different survey plots shows that at places, which are not directly on points of interests, the distribution of recreation forms changed into an increasing percentage of bicyclists. Remarkably, these points are crossings were roundabout hiking trails came together. It seems that these trails are not that popular for the visitors as roundabout hiking trails near points of interests. As mentioned above hikers are the biggest visitor group. It is well-known that there can be conflicts between different kinds of recreation groups. To assess the potential of conflicts it has to be examined how or if the structure of recreationists changes in the future.

The number of persons per dog shows that there are areas with high frequency of people who hike or promenade with their dogs. If dogs were leashed was not considered in this monitoring. This factor should be determined in further visitor monitoring approaches in regard of the sensitive wildlife in the park. The percentage of unleashed dogs will be observed by the park rangers on their patrols, which will give hints for the administration about possible conflicts with national park goals. Another step, which will be made in the following months is a cross-calculation of the visitor numbers with the help of some automatic devices installed in 2012. The first step was made with the implementation of a visitor monitoring but to assess changes and possible conflicts the monitoring has to be continued.

Comparison of visitor surveys gives useful insights: an example of the Kellerwald-Edersee National Park (Hesse) compared to the South Harz Nature Park (Thuringia) in Germany

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Are there differences in the visitor types in typical low range mountain areas in Germany and what recommendations can be made for the administrations? To answer these questions the surveys of a national and a nature park were compared. The surveys were conducted as questionnaire interviews. Survey plots were established at parking places or at crossings of different hiking trails. The survey in the Kellerwald-Edersee national park (NLP-KW-ES) was conducted in the year 2013 with 876 respondents (18 working days, weekend and holidays from spring up to autumn) and the survey in the South Harz nature park (NRP-S-H) in autumn 2013 with 106 respondents (4 weekend days in autumn). In the NLP-KW-ES the first person of each passing group was asked to take part in the survey. The respondents in the NRP-S-H were selected by a question concerning the last birthday.

German nature parks are instruments for the sustainable regional development (IUCN Category V). In contrast to national parks (IUCN Category II) they allocate landscape requirements mainly for recreation.

Study Areas

Differences

NLP-KW-ES (5724 ha) was implemented in 2004. The whole area of the national park is a Natura 2000 reserve. 1.467 ha of old Beech Sites were designated as part of the UNESCO WORLD HERITAGE "Ancient Beech Forests of Germany" in 2011. There are 20 roundabout hiking trails, 7 long distance hiking trails and 2 long distance bicycle-routes crossing the national park.

The NRP-S-H (26.700ha) was established in 2010. There are 8 Natura 2000 reserves (∑ = 5000ha). In this area there are 5 roundabout hiking trails, 4 long distance hiking trails, which lead through the nature park.

Commonalities

The low range mountain areas are at nearly the same latitude. The accessibility through highways is good and there is one certified long distance hiking trail in both parks.

Results

The type of visit differs in these two areas. 51% stay overnight in NLP-KW-ES and 49% come just for a day visit. In the NRP-S-H only a quarter of visitors stays overnight. Regarding the type of accommodation there are some similarities. In both areas one third stays in holiday flats and one quarter stays in hotels. The only noticeable difference is that 19% stay private in the NRP-S-H according to 7% in the NLP-KW-Es region. In both areas the main length of stay is from one up to four days. 21% stay longer than 8 days in NLP-KW-ES according to only 7% in the NRP-S-H. One third visits the NLP-KW-ES for the first time, 15% visit for the second up to the fourth time. In NRP-S-H is visited for the first time by 15% and a third visits it for the second up to the fourth time. Both parks share a high percentage of more than 4 time visitors, which is for both parks near 50%. In both areas the most overnight guests come by car. According to how people get notice of the area, there was a surprisingly high percentage of almost 20% that got to know the NRP-S-H region by the "Harzer Wandernadel" (literally: "Harz Walking Badge"). This is a system of hiking badges based on a network of 220 checkpoints, where guests record their visits by a stamp in a special passport. For the NLP-KW-ES the multiplicators were recommendations from relatives and friends (25%) followed by the internet (20%).

Also the visit-activities in the areas were compared. The most visitors came to the entrances by car (70% NRP-S-H and 60% NLP-KW-ES). Around one quarter in both areas came by foot and bikers were mentioned on the third place (12% NLP-KW-ES and 3% NRP-S-H). Trains and buses were used just by a small number of visitors. The average length of the visit was 3.4 hours in the NRP-SH and 3.9 hours in the NLP-KW-ES. Hiking is the main activity in both areas (NRP-S-H 96% & NLP-KW-ES 82%). In the NLP-KW-ES there were more bikers (13%). In both areas ~60% were male and ~40% female.

Recommendations

For the sustainable regional development it is important to increase the number of overnight stays in NRP-S-H because these visitors spend more money per day in the area than day-visitors do (Job *et al*. 2009). According to the various types of accommodation used by the visitors, the park administration needs an efficient way to keep in contact with the providers of accommodation. For this, the NRP-S-H can learn from the NLP-KW-ES, which runs the network "Nation Park Partners". Both areas have a high percentage of short time visitors (1-4 days) so they should adapt their marketing for that kind of visitors. According to the marketing, it is recognizable that Harz Walking Badge has a substantial importance for the first time contact in the NRP-SH. This can also be a tool for visitor guidance particularly in sensitive areas. The percentages of people who visit both areas again show that the visitors are satisfied with the possibilities of recreation.

It is important to improve or maintain the signage to the entrances of the hiking trails and offer parking opportunities to the visitors, because the majority come to the entrances by car. Additionally proper accessibility for people who use public transport should be considered. The average length of a hiking tour shows what kind of hiking trail system is needed. Both areas have most visitors in middle ages. The percentage of activities should be monitored in short distances, because an increase of a user-group can change the conflict potential between the groups.

Conclusions

Although the differences of visitors are not very pronounced, the comparison of two regions can be recommended, because it shows strengths and potentials of each area. The discussion of the results and experiences of the other park may give each administration useful insights for future management. For exact comparisons a standardized survey design should be used.

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Outdoor recreation and visitor profile of protected areas in Portugal

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Introduction

Leisure, recreation and adventure activities in nature have been growing at a considerable speed, following a new type of tourism, especially since the 70s, responding to a demand of contact with nature and local cultures, particularly in Protected Areas (PA). The National Program for Nature Tourism (*Programa Nacional de Turismo de Natureza - PNTN*) created in Portugal in 1998 follows this trend and defines the assumptions for the consolidation of the country's image as a quality tourist destination, assuming PAs as designed areas for the nature tourism. This program included a set of criteria and regulations regarding hosting and environmental animation, across the documents created such as Nature Sports Charts Plan (*Cartas de Desporto de Natureza - CDN*) that should complement the management plan for each PA. This policy was latter reinforced by the National Tourism Strategic Plan that included Nature Tourism as one of the 10 national strategic touristic products of Portugal.

The Serra de Aire e Candeeiros Natural Park (*Parque Natural das Serras de Aires e Candeeiros - PNSAC*) was the first PA in Portugal to have CDN (published in 2004) that, in conjunction with the last Management Plan (published in 1998) is responsible for the regulation of open air activities within this natural park. Being the CDN in review, it was tried to understand who PNSAC's visitors are and what are their preferences and motivations, in order to improve the park's recreational offer. The second objective of the current study was to define a monitoring methodology that could profile PA users and visitors, and overcome the lack of information regarding this issue in Portugal.

Study Area

The current study was applied in the Serra de Aire e Candeeiros Natural Park (PNSAC) that occupies an area of 39000ha in one of the most remarkable Portuguese geomorphologic and characteristic units, ""Estremadura Limestone Massif"" with a central position an hour from Lisbon. The protection interest, conservation and management is also underlined by the fact of being part of the site PTCON00015 (Serra de Aire e Candeeiros) from the National List of Sites of Natura 2000 Network due to the presence of high conservation values, assuming an important significance in terms of fauna, flora and culture, due to an ancestral human occupation of the territory. Under the CDN of PNSAC nine recreational open air activities are allowed: hiking and Mountain biking are the most popular ones, beyond free flight, ballooning, climbing, orientation, horse riding, speleology and canoeing.

Methodology

Following Nogueira Mendes *et al* (2012), the best location for the field surveys was collected from webshare services (using Voluntary Geographical Information – VGI), for the most important recreational activities offered by the Park. Data from mountain biking, trekking/hiking and all wheel drive was uploaded to a GIS project, and analysed to define the higher use intensity areas.

In-sito assisted questionnaires were collected in 8 places and *In-sito* non-assisted questionnaires were collected in other 6 places/park facilities, suggested by the park authority where visitors were asked to fill the surveys by themselves. For speleology and free-flight (the most specialized activities that are allowed/practiced within the park, online surveys were also used.

Results

A total of 330 surveys were collected through the various methods cited above (134 were collected in-sito, 124 were collected within the park facilities and 72 were filled on-line). According to the results, it was possible to define the following average user profile: male, within 35 to 44 years old, married and with sons. PNSAC users are mainly residents from the surrounding localities and municipalities with a high level of education and an average monthly income between the € 971 and € 1940. Aware that they are in a PA, an average user comes to PNSAC with a regular frequency, mainly to spend some quality time with his family and friends, mostly to hike or to ride a mountain bike. The average duration of these visits are between 2 and 4 hours and he uses his own vehicle to get to the park. He does it mainly with friends, not using accommodation and spending on average € 62 throughout his stay. Regarding the park perceptions, PNSAC users rated "hospitality of the local population" as the most relevant item from answers about what they value most.

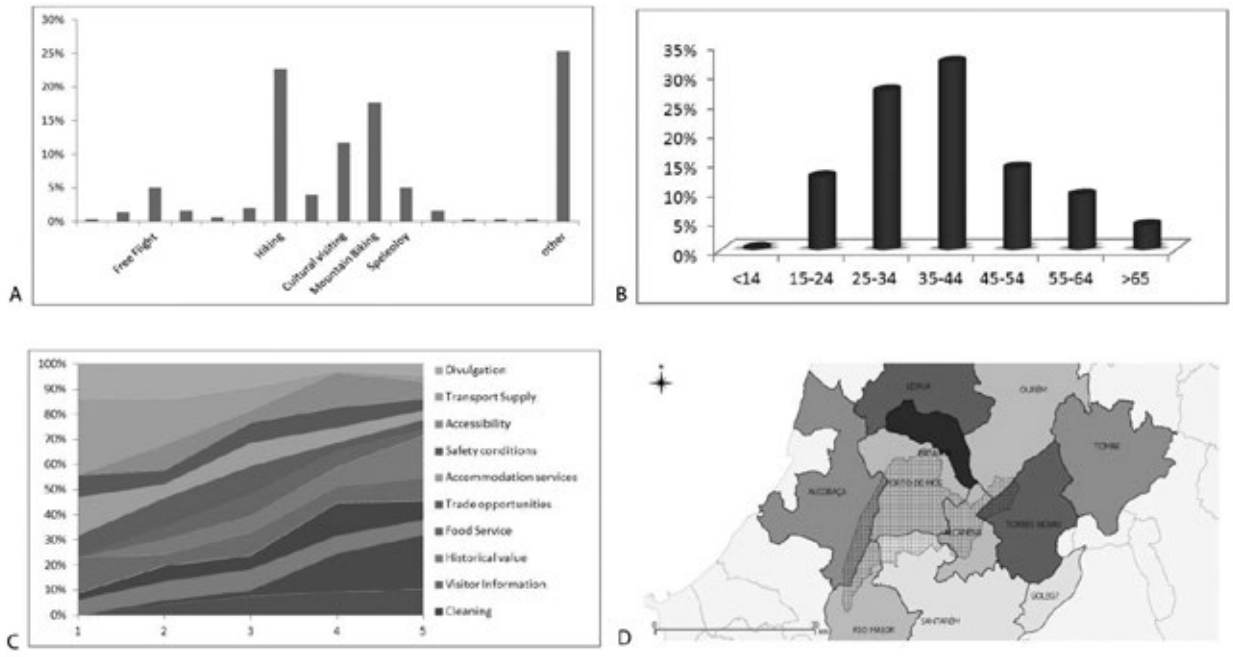

Figure 1. a) Open Air activities in PNSAC; b) Age Groups of PNSAC visitors; c) PNSAC Users preferences; d) PNSAC Users distribution.

Conclusions

The results allowed checking if the proposed methodology worked and if it could be easily replicated in other PAs helping to increase the effectiveness of management of recreational activities. Besides, it allowed profiling park users, which simplifies any communication strategy since people recognize the existence of a management entity. In addition to the natural and cultural characteristics of PNSAC, any strategy to promote this PA should take into account the great appreciation of the hospitality of the local population by the park's users and visitors.

VGI was used in this case to select the better places to collect the field surveys, but further analysis on these services might be of special use to PA managers, due to the polyvalence provided by nowadays' social networks.

Acknowledgements

This paper presents research results of the Strategic Project of e-GEO (PEstOE/SADG/UIo161/2011) Research Centre for Geography and Regional Planning funded by the Portuguese State Budget through the Fundação para a Ciência e Tecnologia.

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Who is hiking in the Tatra National Park, Poland? A socio-demographic portrait of visitors

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Introduction

Comprehensive understanding of visitor behaviour in the protected and recreational areas is the key factor supporting management of those sites (Cessford & Muhar, 2003). Socio-demographic, psychographic and behavioural characteristics of visitors may be useful while planning and allocation of infrastructure as well as provisioning tourist information.

Effective management of visitors is especially important in heavily used protected areas, such as the Tatra National Park (TPN) in Poland (Zwijacz-Kozica, 2007). The area of 211 km2 attracts approximately three million visits annually and 65 % of the observed visitor load concentrates in the summer season (Czochanski & Borowiak, 2000). Hiking along designated trails is the most popular activity in TPN and therefore it is crucial to better understand this dominant visitor segment.

The aim of this paper is to present the results of a survey campaign conducted in the summer season 2013 in the Western Tatras, Poland. This investigation is a part of the extensive pilot study concerning visitor monitoring in the Tatra National Park (Ziobrowski et.al, 2014).

Study Area

The Tatra Mountains are situated in Central Eastern Europe and are the highest range within the Carpathian Mountains. Almost the entire area lies within the borders of two independently managed national parks: Tatransko Narodny Park in Slovakia and Tatrzanski Park Narodowy in Poland. The presented study was carried out in the polish part of Western Tatras (Figure 1). The main focus was placed at Czerwone Wierchy massif, due to the planned reconstruction of hiking trails in this area.

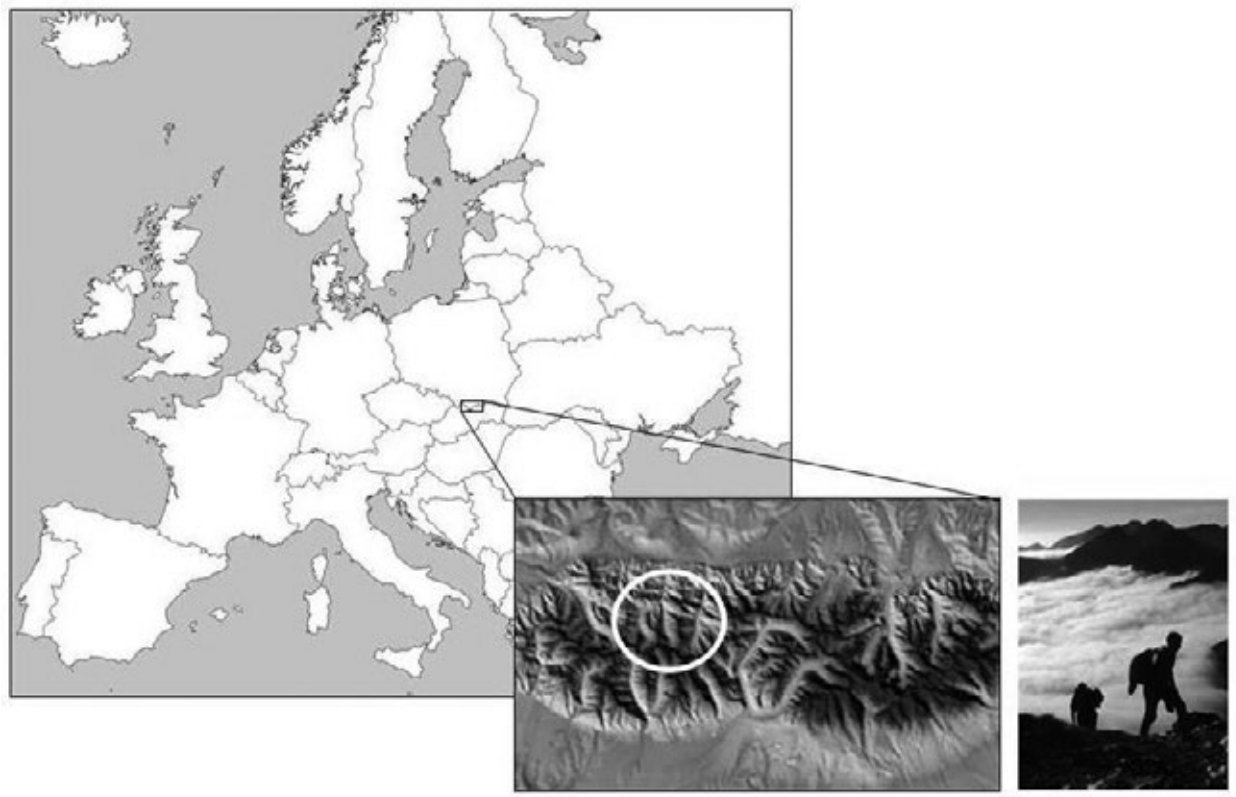

Figure 1. Localization of the case study area: Czerwone Wierchy massiv, Western Tatra, Poland

Methods

The survey campaign took place between June and September 2013 on 15 sampling days at 15 National Park locations. The total number of 2106 hikers was interviewed on-site using structured questionnaires (PAPI technique). Additionally, the respondents were asked to draw their hiking route in the map. The statistical analysis was done using SPSS software. The analysis of visitors' routes was done using a mixed MS Access and GIS approach developed by Hinterberger (1999) and adapted by Taczanowska (2009).

Results and Discussion

The majority of hikers in Czerwone Wierchy massif visit the Tatra National Park regularly once a year (41% of respondents), spent in the region 8 days and hiked 6 days in the National Park area. One quarter of the respondents come to the Tatra Mountains several times a year (25%). There were slightly more men (52%) than women (48%) hiking in the area; visitors were mostly young (median = 35 years) and well-educated (60% of hikers have higher education, 27% - secondary education).

85% of the respondents live in a city (25% city>500.000 inhabitants, 24% 100.000-500.000 inhabitants, and 36% city <100.000 inhabitants); only 15% of hikers live in a village.

Among the most important motives for visiting the Tatra National Park were: escape from urban life, admiring landscape, contact with nature, time spent together with family and/ or friends, health and physical activity. Also silence was an important motivating factor (for 52% of the respondents it was very important, and for 33 % rather important). Nevertheless, loneliness was largely unimportant (44,5%) or indifferent (28%) for Tatra hikers. Also observing animals was not significant for the interviewed visitors.

In comparison with the results from other mountain areas, such as Austrian Alps (Muhar *et al.*, 2007), the Tatra hikers are younger. The major difference refers to the age category 16-30 years, which dominates in the Tatra and is less frequent in the Alps. Another difference denotes participation of male and female visitors in hiking activity. The share of male and female hikers in the Tatra is almost equal, while in the Alps slightly less woman hike in the mountains. A high share of visitors with completed tertiary education is common for both areas.

Conclusions & Outlook

Hikers are a core group in the Tatra summer tourism. Knowledge concerning socio-demographic characteristics of visitors can support visitor management in the National Park in many ways. For instance, it can be used for designing strategic tourist offers and environmental awareness campaigns. In future, comparisons with the Slovakian hikers as well as visitors to other areas in the Carpathians and other mountain ranges are planned.

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SESSION 1B COMMERCIALIZATION OF RECREATION. UNDERSTANDING OUTDOOR RECREATION PRODUCT

Consumer preferences for riding lessons in Finland, Sweden and Latvia

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Introduction

Equine sector has found its place on the urban – rural fringe and horse stables offering riding services are an important rural livelihood around cities. The equestrian sector contributes to the production of new services by combining social needs of urban population with natural opportunities of rural areas. The possible clientele of the equine services is changing at the same time as the population on urban-rural fringe changes. Knowledge of needs and wishes of possible new and current clients is important for the systematic development of the services in equine sector.

Discrete choice modelling has been used to research empirically the consumer choice and applied also to quantify the importance of service characteristics in rural tourism, hospitality and leisure. Some of these studies have had riders as members of respondents, but the focus has been on recreation services in general (Colombo *et al*. 2009, Christie *et al*. 2007, Albaladejo-Pina & Díaz-Delfa 2009). Albaladejo-Pina & Díaz-Delfa (2009) show that the probability of lodging at a rural house is affected positively when the house has the possibility of hiring horses. Christie *et al*. (2007) studied riders as one of the forest user groups and determined the attributes that are important in horse activities in forest. Beyond these few studies, we found none focusing only on riders as clientele and their demand for riding services.

In our study, we are interested in the most typical riding good, a riding lesson, and in the attributes that affect the choice between riding sites. We use choice modelling approach by focusing on stated choices, as some attributes of interest are new and not supplied at present. The aim of this study is first, to measure riding lesson choice in Finland, Latvia and Sweden among potential clients for riding schools. Second, we model the riding lesson choice by taking into account the clientele heterogeneity i.e. we define the various consumer segments in each country. Third, based on the consumer preferences we provide willingness to pay estimates for the most interesting riding lesson types.

Methods

Respondents to the survey were current and potential riders and people with horse related activities. In Finland, all together 438 Finnish respondents, 430 Swedish responses and 457 responses from Latvia were obtained. In this study, we examined a riding lesson choice in Finland, Sweden and Latvia using a choice experiment method. In the questionnaire, the respondents faced different choice sets, each set containing two riding lesson alternatives and a no-choice option. The riding lessons had several attributes and the level of attributes varied across alternatives. The riding environment had four levels: riding field (baseline), riding field and bridle paths, riding field and indoor arena, and riding field, indoor arena and bridle paths. Also natural environment had four levels: pasture (baseline), meadows and pasture, forests and pasture, and forests, meadows and pasture. The level of teaching varied from no teaching to amateur and qualified teachers. Horses were either easy to ride, hobby level or highly trained. One-way distance in time to the stable varied from 15 minutes to 1.5 hours. The price attribute varied in Finland from 10 € to 70 €, in Sweden from 100 SEK (8 €) to 800 SEK (66 €) and in Latvia from 3.5 LVL (5 €) to 35 LVL (50 €). To examine potential new added value for the lesson, we included focus attribute, so that the stable was focusing on horse welfare, customer convenience or developing horsemanship.

As we were interested in consumer segments, a latent class model was used in this study. The latent class model reveals both the consumer segments and the relative preferences for product characteristics in each consumer segment.

Results

The latent class models reported in Table 1 show that the consumers were not alike. Even though there were some differences between Finland, Sweden and Latvia, the three consumer segments in each country can roughly be characterized as "Low interest in lessons", "Importance of recreation setting/Recreational riders" and "Interest in skills". These segment names are interpretations based on coefficients in latent class models but also the socio-demographic and activity profile.

In the latent class model for Finland, the class sizes were rather even although the class with low interest in lessons was slightly larger and the class with interest in developing skills slightly smaller. The classes had equal preferences for the quality of horses, distance and price but the preferences for the other attributes differed. In the "Importance of recreation setting" segment, both the riding environment and the natural environment had higher effect on the utility than in other segments. This segment also valued highly particularly the horse welfare as the focus of the stable but also customer convenience and developing horsemanship were important. Developing horsemanship was of importance also for the segment "Interest in skills". However, the attribute that affected most on their utility was the qualified teacher. This attribute was of some importance also for the segment of "Low interest in lessons".

In the model for Sweden, the coefficients for natural environment and price were the same for all the segments. The preference profiles of the segments resembled those of Finland with some differences. The "Importance of recreation setting" segment preferred particularly the riding lessons with high quality riding environment with indoor arenas and bridle paths. For them, also the high quality horses and a short distance were of more importance than to other Swedish segments.

In Latvia, the segments differed only in their preferences for teaching, focus, distance and price. Still, also in Latvia, we could identify a segment with interest in skills as there were riders that had high preferences for a qualified teacher. The segment of "Recreational riders" valued highly the customer convenience focus and for them the distance to the stable had even positive sign suggesting orientation for touristic rides. The "Low interest in lessons" class had higher negative coefficient for the price compared to the other classes, implying lower willingness to pay for a riding lesson. However, this segment of Latvian riders had rather strong preference for developing horsemanship.

The latent class models for all three countries were used to estimate the price premiums for various types of riding lessons.

Table 1. Latent class models for riding lesson choice.

	Finland			**Sweden**			**Latvia**		
	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3	Class 1	Class 2	Class 3
Pseudo R^2	0.0538	0.2415	0.2339	0.0736	0.2126	0.4179	0.1389	0.1586	0.2678
Class Size	0.3832	0.3226	0.2943	0.4271	0.3893	0.1836	0.3564	0.3529	0.2907
CONSTANTS	*Low interest in lessons*	*Importance of recreation setting*	*Interest in skills*	*Low interest in lessons*	*Importance of recreation setting*	*Interest in skills*	*Low interest in lessons*	*Recreational riders*	*Interest in skills*
No choice (reference level)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lesson A	-0.55	2.37	3.44	-0.84	2.96	1.76	0.61	2.47	1.41
Lesson B	-0.48	2.36	3.66	-1.22	2.97	1.82	0.69	1.92	1.73
ATTRIBUTES									
Riding field (reference level)	(***)	[***]		(***)	[**]		(-)		
Riding field and bridle paths	-0.37	0.74	-0.39	0.26	0.52	0.23	0.32	0.32	0.32
Riding field and indoor arena	-0.08	0.90	-1.06	0.47	0.37	-0.15	0.13	0.13	0.13
Riding field, indoor arena and bridle paths	0.48	1.34	-0.90	0.89	1.23	-1.16	0.35	0.35	0.35
Pastures (reference level)	(***)	[**]		(-)			(-)		
Meadows and pastures	-0.65	0.78	-1.12	0.29	0.29	0.29	0.08	0.08	0.08
Forests and pastures	-0.56	0.88	-0.48	0.30	0.30	0.30	0.10	0.10	0.10
Forests, meadows and pastures	-0.47	1.13	-0.90	0.32	0.32	0.32	0.16	0.16	0.16
No teaching	(***)	[***]		(***)	[***]		(***)	[***]	
Amateur teacher	-0.26	-0.17	0.22	0.93	0.11	0.45	0.31	0.60	1.30
Qualified teacher	1.30	0.05	1.69	1.68	0.39	1.90	0.84	0.26	2.83

Easy horses (reference level)	(***)			(***)	[**]		(**)		
Medium level hobby horses	0.36	0.36	0.36	-1.11	-0.35	-0.20	-0.03	-0.03	-0.03
Highly trained horses	0.69	0.69	0.69	0.39	0.81	-0.66	0.34	0.34	0.34
No focus	(***)	[***]		(***)	[***]		(***)		
Customer convenience	-0.21	1.12	-0.90	0.41	0.31	-0.39	-0.56	1.05	-0.26
Horse welfare	-0.08	1.85	-0.26	1.03	0.48	2.11	0.39	0.51	0.87
Developing horsemanship	0.21	1.01	0.50	0.94	0.07	2.93	0.72	0.69	0.49
Distance	(***)			(***)	[*]		(***)	[***]	
	-0.92	-0.92	-0.92	-0.80	-1.03	0.05	-0.93	0.59	-0.40
Price	(***)			(***)			(***)	[***]	
	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01	-0.10	-0.03	-0.03

Note : (***), (**) and (*) show Wald test for p-value at 1%, 5% and 10 % significance levels, respectively. [***], [**] and [*] show Wald test p-value for class independence at 1%, 5% and 10 % significance levels, respectively.

The logistic regression models for each class provided information on the socio-demographic and activity variables that significantly associated with the membership of each class. Despite some differences, the classes had many similarities between countries. Class "Low interest in lessons" was characterized by older age, urban living and lower education level. There were many horse owners among respondents in this class and they were often members in a riding club. Respondents in class "Importance of recreation setting/Recreational riders" were younger and they had no or few children. Many lived on farms and had higher education. Class "Interest in skills" included more males than two other classes. Respondents in this class were older, had few children, lived often on farms and had lower education. This class had few horse owners, but many of the respondents were members in a riding club.

Discussion and conclusions

This study revealed the important characteristics of riding lessons in Finland, Latvia and Sweden among the actual and potential clients for riding schools. The results were promising as in the choice experiment the clients were able to express their preferences in a rational way.

The selected attributes, riding environment, natural environment, teaching, horses and the focus of the stable as well as price and distance, all had importance at least for one segment of clients in one of the countries. The latent class model by segments revealed clear heterogeneity among the clients in each country. However, the identified consumer segments were surprisingly similar in all of the three countries. From the few previous studies, we can also compare with Christie *et al.* (2007). In our study, as in theirs, the riding environment was not the most important attribute for riders. In their study, the provision of general facilities such as parking, toilets, play areas and picnic areas increased utility while the added provision of a cafe´/shop reduced it. Our study defined that the services increasing customer convenience were important attributes for one segment of clients.

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The supply of nature-based tourism in Sweden. A national inventory of service providers

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This paper provides a descriptive overview of a national inventory of nature-based tourism (NBT) service providers in Sweden. In order to obtain a representative sample a "geographical distribution" approach was used based on the cooperation of regional tourist bureaus. As a result, contact information of 2060 service providers was received. Following two non-response check-ups and a screening question the effective sample was 1821 and the follow-up web survey resulted in 648 valid responses.

Background

Sweden, having a strong tradition and long history of outdoor recreation, has experienced a relatively recent expansion of nature-based tourism (NBT) as a commercial activity. Given the richness in natural resources Sweden should be well positioned to develop nature-based tourism (NBT). Existence of natural resources is, however, not the only criterion for successful tourism development. As pointed out by Fredman and Lundmark (2008), Lundmark and Müller (2010), Fredman, Lundberg and Wall Reinius (2014) and others, access to resources, infrastructure, professional networks, competence, social and economic capital also matters to a large extent.

Little has been known through systematic data collection and research about the supply side of NBT, comparing to the demand (Fredman & Tyrväinen, 2010). Two main reasons for the lack of statistics in the NBT sector have been the absence of inventories, based on common definitions and the inadequate design of the industry classification system. The purpose of the study was to address this issue and do a complete inventory of NBT service providers for the entire country. This is to our knowledge the most comprehensive inventory ever done on the NBT supply in Sweden, which, hopefully, will serve the objective to provide an up-to-date description of this sector.

Survey method

The sample for the survey relied on the information provided by 308 regional tourist bureaus located all over the country. The tourist bureaus were contacted via telephone and asked to provide contact information of the NBT companies in the region. As a definition of NBT, the definition suggested by Fredman *et al*. (2009) was adopted, where NBT implies activities occurring when visiting nature areas outside the person's ordinary neighbourhood. Based on the responses of the tourist bureaus and supplementary Internet check, a sample of 2060 NBT companies was collected.

To the collected sample of NBT companies, a comprehensive questionnaire was distributed. The questionnaire consisted of 7 sections. Section 1 contained questions regarding general profile of a company, type of services provided, organizational characteristics of a company, geographical distribution. Section 2 aimed to acquire information on the issues of land use and access to nature, such as the type of land ownership most important for the business operations, opinion of the respondents on the impact of other land users, the role of the Right of Public Access, National Parks and the importance of various types of nature for their NBT business. Section 3 asked questions regarding the measures of sustainable development within a given NBT company. Section 4 aimed to capture economic characteristics of the company, such as the number of the employees, annual turnover and seasonality. Section 5 included questions on market characteristics. Section 6 inquires about the importance of formal and informal networks. Section 7 concluded with the background and demographic information of the respondent.

The survey was distributed online to the email addresses of the NBT companies using NETIGATE online survey software in two rounds (May-June 2013 and November-December 2013).

Results

As a result of the survey distribution, there were in total 648 responses collected (35,5% response rate). Some key highlights from the survey results can be summarized as follows:

The general impression from the results is that NBT is a rather diversified sector, which relies on multiple business operations. Only about 20 % of the companies have 100 % of their annual sales from NBT. There are a small number of large and a large number of small NBT service providers in terms of annual sales. Just over 60 % of the companies reports at least one full time year round employment while 40 % have at least one part time year round employment working with NBT operations.

The supply of NBT in Sweden revolves around different types of water based activities to a large extent when measured vis-à-vis importance to annual sales. It is also a summer business – between 60-80 % of all respondents ranked the months June-September as the most important season. Guided activities in nature and accommodation are ranked as the most important business activities while fishing, kayaking, canoeing and/or rafting are the most important recreation activities.

Future growth of the Swedish NBT sector is likely. While 37 % of the companies classified themselves as being in a growth phase and 6 % in start-up, only 8 % were in recession and 2 % in liquidation. The majority of the companies are dependent on access to land with an external ownership. The freedom to roam in nature is very important to three-quarters of all respondents while only 4 % think this opportunity is of no importance at all. Hiking trails and cabins are the most important types of infrastructure.

The three most important nature environments for NBT operations in Sweden are forests, lakes, rivers and waterfalls. Hydroelectric dams, wind power plants and forestry are among the most negatively perceived by the companies in this study. Looking at the importance of different wildlife we find that fish, birds and moose are the most important. Only about 14 % of the companies report activities within or in the 5 km range from a National Park.

The majority of the sales are from the private market segment. On average, about 14 % of the companies report heavy reliance (proportion of 80-100%) on customers from the same county where the company is registered. In contrast, only about 5 % report the same reliance on customers from Sweden outside the county where the company is registered. Finally, 17 % report similar proportion of customers from countries other than Sweden (international customers). The most important foreign markets are Germany, Denmark, the Netherlands and Norway.

Almost half of all respondents worked in another non-service company immediately prior to starting/getting employed by the current NBT company. Only one third worked in another service or tourist company.

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Norwegian nature mangers' attitudes towards nature-based tourism in national parks – a survey analysis

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The paper is part of a research project funded by the Research Council of Norway, '*Prospects for Managing Tourism Development in Protected Areas in a Period of Transition (PROTOUR)*'. The research project goal is to analyse various management prerequisites for developing and managing nature-based tourism inside and adjacent to Norwegian national parks: Do managers support expanded tourism activities in the national parks, and what social factors explain support for tourism developments? One task in the project is to analyse these preconditions by means of an Internet-based survey among Norwegian protected area managers.

In recent years, Norway has designated a significant number of protected areas. Today's 37 national parks and other protected areas comprise 17 per cent of the land mass on the country's mainland, but little management attention has been given to the potential for nature-based tourism in this context. For example, the Nature Diversity Act from 2009, which is the basic legal framework for managing protected areas in Norway, does not refer to tourism (Haukeland *et al*., 2013). The principles of *allemannsrett*, which allows for unrestricted foot access to all in natural areas (areas which are not regarded as cultivated) such as national parks, are the foundation for mostly self-organised independent activities. Visitor services are thus traditionally not seen as necessary in protected areas (Haukeland & Lindberg, 2001). The Norwegian management system is short of expertise in managing visitor needs and desires in the national parks, and there is a need to develop capacities to ensure an appropriate partnership with local tourism businesses. This is also in line with the national government policy that has signalled a desire to use sustainable tourism development in protected areas as a regional development tool (Nærings- og handelsdepartementet, 2012). Besides, managers' facilitation for tourists' needs and desires becomes requisite as visitation in the national parks is expected to increase in the future.

Our Internet survey was conducted among nature mangers in Norway in 2013. The nature management system in Norway has a rather complex structure and the survey therefore includes staff members of various governmental bodies on central (national), regional and local levels. Thus, central agencies, such as the Ministry for the Environment and the Norwegian Directorate for Nature Management (now coined the Norwegian Environment Agency), and regional and local planning units, such as county municipalities, county governors, local municipalities, local national parks boards and local mountain boards, were included in the survey. In the Nature Inspectorate, employees on both national and local levels were included. On regional and local levels, the sample was restricted to the geographic areas included in the PROTOUR project, i.e. the so-called *Nasjonalparkriket* [The National Park Realm] in the northern part of Oppland County, *Hardangervidda National Park* (Norway's largest national park) and *Ytre Hvaler National Park* (Norway's first marine national park).

A comprehensive search by websites and phone calls identified email-addresses for relevant officials within the various management organisations. This resulted in a sample of 330 respondents, of which 137 completed the survey after four reminders, i.e. a response rate of 42 per cent. The online questionnaire company QuestBack was used to administer the survey.

The study revealed some basic demographic statistics about nature managers. Two thirds have completed environmental science education (nature management, biology, ecology) on university level (or similar) and about one in five has finalised education in biophysical science (mathematics, physics, chemistry). Only 8 per cent have studied outdoor recreation and 7 per cent have studied tourism, whereas one in five has a social science background. Combinations of various educational programs also appear among the managers.

The nature managers largely support tourism developments in and around Norwegian national parks; 75 percent say they favour such expansion compared to only 14 percent who oppose it. The majority of respondents also believe that the nature management should expand its responsibility, both to cater for visitors' interests and to assist the tourism industry. In general, a large majority is in favour of facilitating visitation within national park borders, in terms of signposting, nature information boards and built-up hiking tracks. There is also a prevailing support for lookout towers and facilitated viewpoints, whereas the desires for developments such as picnic areas, toilets, fishing spots, facilitated infrastructure and developed walking routes for disabled persons, and waste containers (in particular) are more diverse.

Structural equation modelling (SEM) of the survey data reveals that educational background within the social sciences lead to greater support for tourism development (i.e. expansion of tourism within park borders and backing of visitor and tourism industry interests). Support for tourism in turn leads to more expressed desires for the facility developments outlined in the previous paragraph.

The survey material also shows that the managers' professional training in market analyses/ marketing, tourism product developments/ provisions, economics/ sales, and the tourism discipline in general is largely considered insufficient to deal with tourism-related issues in protected areas. These types of expertise belong to the domain of the social sciences. Based on the survey results, we have reason to conclude that recruitment of social scientists within the management system (or social science training among managers) is a prerequisite for a stronger support for tourism development and the associated facilitation for visitors. At the same time, increased concern for handling tourism development challenges will also lead to a higher demand for more composite professional staff of managers, which will include personnel with social science background. A stronger support within management for tourism developments and visitor facilities in Norwegian national parks will probably be the outcome of these social processes over some time.

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Proposed methodological framework for empirical testing the product-based typology for nature-based tourism

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Introduction and research focus

Following a deductive approach Arnegger *et al.* (2010) propose a conceptual framework for a product-based typology for nature-based tourism. Their framework is built on two dimensions, one reflecting the demand side and the other the supply side of tourism products. Arnegger *et al.* (2010) developed the typology as a conceptual framework for segmentation approaches of nature-based tourism products that on the one hand reflect the complex structure and diverse forms and types of nature-based tourism and on the other hand rely on a manageable number of indicators as a segmentation base of the market and for the socioeconomic monitoring of visitor segments in protected areas.

The aim of the present study is to adapt the product-based framework to tourism in protected areas and to develop and to empirically test an appropriate operationalization, which has –to the authors' knowledge – not been done so far. Emphasis is given to the demand side dimension, namely "nature as point of attraction".

Conceptual framework

Arnegger *et al.*'s (2010) conceptual framework is based on two dimensions: a) travel motivations and activities, namely "nature as point of attraction" and b) service arrangement of the products, namely "individuality". The first dimension consists of four discrete categories of travel motivations and activities: "nature protection", "nature experience", "sports and adventure" and "hedonist". The dimension "individuality" consists of another four discrete categories, namely "independent", "à la carte", "customized" and "fully standardized". Hence within this two-dimensional framework there are 16 ideal types of tourism products. This framework was developed for nature-based tourism in general. Within the present study the framework will be adapted to tourism in national parks.

The conceptual framework of Arnegger *et al.* (2010) lacks a clear definition of the tourism product and its production process as well as a discussion of the travel decision process and tourist motivations, which is necessary for operationalization. According to Smith (1994: 583f), from a demand side view, a tourism product is an (more or less) individual bundle of activities and service arrangements resulting in a "tourist experience", the final output of a tourism product (see figure 1). From a supply side view the tourism product is a single product (like a guided tour) or several intermediate outputs (services), like transport services, cultural performances, accommodation, etc. combined in a tourism product or package offered by tourism companies.

Fodness (1994: 558) describes the travel decision process with a functional approach: Tourists are motivated by certain needs for travel and satisfy their needs by certain activities during their journey. The outcomes are travel experiences and certain benefits or satisfied needs (Fodness 1994). The pattern of motives/benefits and activities is also reflected in tourism typologies. Tourism typologies can be subdivided into cognitive-normative and interactional typologies (Hvenegaard 2002). The first named typologies segment tourist by motivations or benefits and the latter by activities. The product-based typology combines central aspects of the tourism production process and the travel decision process (see figure 1).

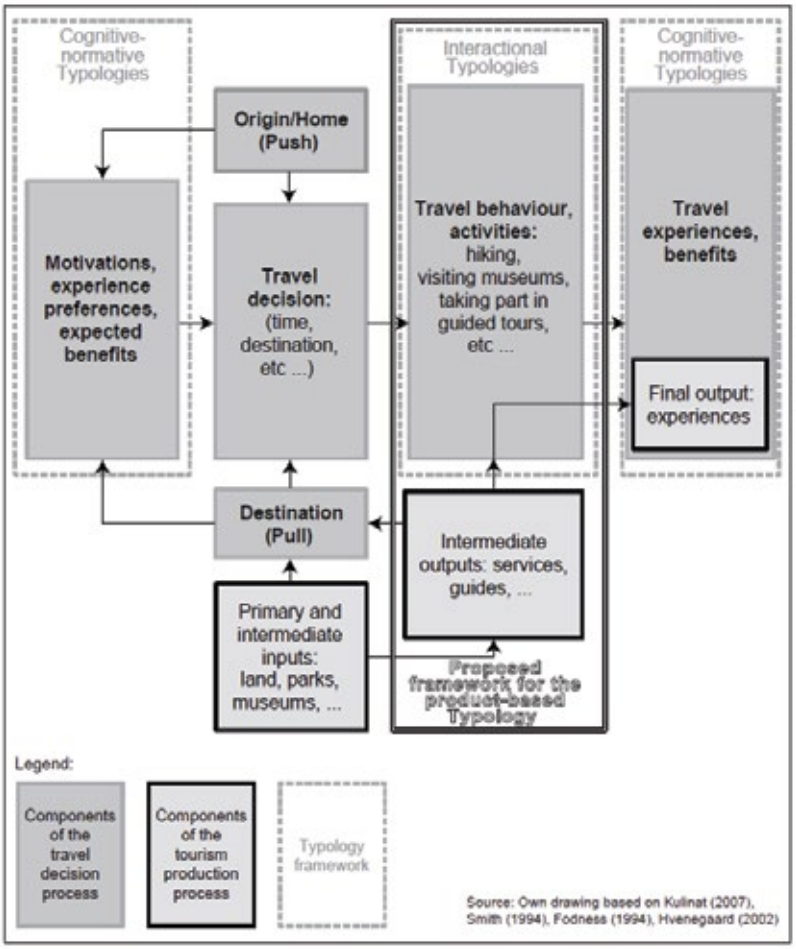

Figure 1: Tourism production and the travel decision process

Methodological framework

Within this section a methodological framework for differentiating tourism products from a demand side view will be presented. Following the approach illustrated in figure 1, the dimension "nature as point of attraction" can be measured via motives/benefits or activities. Activities are used for segmentation amongst others by Hvenegaard (2002) and Mehmetoglu (2007). Hvenegaard (2002: 15) prefers activity-based segmentation approaches because they produce more distinct patterns than motivation-based approaches. Mehmetoglu (2007: 658) states that activity-based segmentations are better suited for the tourism industry. The reasons for this are that activities are highly related to the tourist's environmental and economic impacts, i.e. caused by their expenditure. As Arnegger *et al.* (2010) claim that the product-based typology should be based on rigid criteria and be used in combination with socioeconomic monitoring, which includes an impact assessment of protected area tourism, an activity-based segmentation seems more appropriate for this research context.

To define products or activity segments from a demand side perspective, a factor-cluster segmentation approach is applied which is widely used in nature-based tourism segmentation studies. To describe the interest in nature of the different activity segments a Nature-Tourism Interest Scale (NIS) was developed based on Juric *et al.*'s (2002) Ecotourism Interest Scale. The NIS is constructed via a principal component analysis (PCA) and consists of nature-oriented activity and expected benefit items. Hence it consists of items from both sides of the functional dimension of the travel decision process outlined by Fodness (1994): i.e. "to learn about nature", "watching wildlife" or "seeing wilderness and undisturbed nature". These items are measured on a five-point importance scale.

In order to test the developed operationalization for the dimension "nature as point of attraction", a visitor survey was carried out in Berchtesgaden National Park (Germany) in autumn 2013. A total of 175 questionnaires were collected with information about travel activities, motives and service arrangements.

Preliminary analysis and discussion

A PCA of travel activities revealed four factors. To identify groups of similar trip activities, hierarchical clustering was employed (Ward's method). Using Mojena's test statistics, a five cluster solution was selected:

- The first cluster represents respondents who are overproportionally participating in activities with a strong focus on nature as excursions for environmental education ("special nature experience cluster").
- The second cluster is characterized by tourists whose activity pattern is dominated by activities with a general focus on nature, like visiting natural attractions ("general nature experience cluster").
- More physically challenging activities such as trekking or mountain biking are preferred by vacationers in the third cluster ("sports activity cluster").
- The fourth cluster reveals patterns of the hedonist category, but with a rather high interest in nature at the same time ("high nature interest hedonist cluster").
- The remaining cluster is characterized by very low activity rates in general ("low activity (hedonist) cluster").

The NIS shows significant differences between the five clusters: the cluster representing the segment with a strong nature focus scoring highest and the low activity hedonist segment scoring lowest, although the categories in between are less distinct from another.

On the whole three clusters can be matched with the first three categories of the typology. However the first empirical cluster identified in this analysis stands for "special nature experience" rather than "nature protection". As mentioned above, the two clusters revealing patterns of the hedonist category also show some deviations from the ideal type framework. Further analyses have to reveal if these deviations imply modifications of the ideal type categories.

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Maintaining competitive tourism advantage with reference to the Greater Blue Mountains World Heritage Area

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Introduction

Business literature is replete with examples of industries that failed to adapt to emerging trends and lost competitive advantage (see Levitt, 1975 - historical examples). To maximise opportunities, industries must identify sources of competitive advantage, and adapt. Tourism (including recreation) is particularly vulnerable to a diversity of external forces that threaten competitiveness (climatic variability/change, residents' attitudes, terrorism/crime).

Australia's main competitive tourism advantages are climate, natural environment, and wildlife. However, the basis of this advantage has been challenged. For example, the Blue Mountains, historically one of Australia's best-known/popular tourist destinations has experienced a downturn in tourism and risks further decline. We use the Greater Blue Mountains World Heritage Area (GBMWHA) to highlight some destination tourism marketing issues.

GBMWHA

The Blue Mountains, now a segment of the GBMWHA, located west of Sydney (Australia), has been a nature tourism destination since the 1860s due to its majestic views and cooler summer climate. Currently it is the most comprehensively protected area in Australia. Over 100,000 live in the GBMWHA, although geographically the population is concentrated. Most live in villages along the Great Western Highway, although 75% live within the Blue Mountains City Local Government Area (LGA).

Some strategic issues for tourism

Lack of shared vision

Strategy requires identifying/managing key issues affecting an organisation's future. Fundamental elements in crafting a successful strategy include strong, shared 'vision' of desired outcomes among stakeholders, and leverage of core competitive strengths (Johnson *et al.*, 2008). The GBMWHA, tourism stakeholder 'success' depends on a diversity of public/private sector organisations/individuals that apparently lack cohesive motivation for tourism. One impediment to leveraging is the continued focus on Katoomba as the tourist destination and thus <10% of the Region.

Another complication in developing a holistic strategic approach is variation in socio-economic status across GBMWHA. Although overall, the average affluence of the area is higher than Australia generally, there is considerable variation among villages. For example, many Leura properties are Sydney-based residents' 'weekenders' who typically oppose development of their 'retreat'. Conversely, less affluent Katoomba Centre with small rented shops (cafes, souvenir shops) has pro-tourism operators although many of their Sydney-based landlords resist street frontage renovation even with a 50% LGA subsidy.

Branding and positioning

A brand (name, symbol, logo, design, image) identifies a product, service or place. Positioning is the act of subsequently designing/communicating the brand to ensure an impact on target markets, and positive differentiation from competitors. The importance of strong branding and clear positioning is increasingly acknowledged (Kotler *et al.*, 2006). However, the GBMWHA lacks a clearly-defined, overarching brand and positioning. For example, the Blue Mountains City LGA promotes outdoor activities (bushwalking, horse riding) and dramatic scenery. In contrast, Hawkesbury LGA typically focuses on farm-based (fresh food, accommodation), or riverine (swimming, kayaking) activities. In addition, Blue Mountains LGA promotes a 'grand drive' self-guided tour. Hawkesbury LGA promotes the 'farm gate trail' and 'Hawkesbury artists trail' among others. Neither LGA promotes a strongly positioned, clear brand proposition for the GBMWHA or links with other LGAs to leverage Regional strengths/communicate a consistent tourism message.

Public infrastructure

The GBMWHA has effective road/rail links with Sydney which supports tourist access to local villages. However, apart from the two trans-mountain highways some vehicular access maybe over unsealed roads (Glow Worm Tunnel Road, Bilpin-Mt. Wilson loop-road). Large zones of GBMWHA are also designated 'wilderness' and restricted to foot traffic. Most signposted walking tracks are around Katoomba, and there are no formal long-distance wilderness tracks. Large areas are, therefore, inaccessible.

Major tourism entertainment infrastructure has been concentrated around Katoomba, and recent expansion includes the Echo Point Scenic Lookout, cable car scenic ride, expansion of The Edge cinema, and the Cultural Centre. Outside Katoomba, such infrastructure tends to be scattered widely (State Mine Heritage Park [Lithgow], Norman Lindsay Gallery [Faulconbridge], Mount Tomah Botanic Gardens, Jenolan Caves limestone caverns). These attractions were developed when group/family visitation was the norm, and typically offer 'passive' attractions with limited response to potential new markets.

One tactic used by many destination-based tourism service providers (museums, zoos, art galleries) to encourage repurchase is 'special events' (Kotler *et al.*, 2006) that may be time- (Harvest Festival) or product- (unique animal birth/acquisition) inspired. The GBMWHA has 'Yulefest/Christmas in July', Jenolan Caves' Christmas carols/classical symphony recitals, and small-scale/village-specific events. However, additional activities could be expanded and timed to maximise visitation.

Commercial outlets

Hospitality incorporates customer service (intangible) and decor (tangible), the 'quality' of which is customer-determined (Kotler *et al.*, 2006). Several 'flagship' hotels in the GBMWHA have suffered negative publicity in recent decades. For example, The Carrington (Katoomba) and Hydro Majestic (Medlow Bath) were closed for substantial periods, and more recently the Fairmont Resort also received criticism for 'damaging the area's reputation' (Desiatnik, 2010). However, other accommodation enterprises have prospered. Contemporary demographic and psychographic consumer needs are reflected in 'boutique' hotels offering 'self-indulgence' while environmentally sustainable principles (solar energy, recycled water/building materials) are espoused by others.

Conclusion

Tourist destinations relying on a single drawcard (climate, scenic beauty) are vulnerable to fashion change. As a tourism destination 'product', the GBMWHA appears to be in the decline stage of the 'product life cycle' from its historic position of market leader. In recent decades, the world has shrunk, virtually. Electronic media (internet, social media) more effectively expose potential tourists to cultures/landscapes than previously. Travel is more affordable, and more travel. Attracting new market segments and developing 'new tourism products' that capture changing preferences requires an integrated approach based on shared vision, branding and positioning. The GBMWHA has not yet taken advantage of its status as a World Heritage Area (Hardiman and Burgin, 2013) and developed a shared vision.

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SESSION 1C PUBLIC INVOLVEMENT IN RECREATION PLANNING PROCESSES

Integrating immigrant communities in recreation planning for the Wienerwald Biosphere Park, Austria: first results

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Introduction

Underrepresentation of ethnic minority groups in outdoor recreation has been described by researchers in many Northwest European countries, the US, Canada and Australia. People from ethnic minorities are often observed using public urban spaces close to their neighborhood (Kloek *et al.*, 2013), but may not be represented in peri-urban recreational areas. Differences in socioeconomic status can explain these phenomena, but differences in cultural backgrounds also affect preferences in leisure activities (Kloek *et al.*, 2013; Peters, 2010).

Peri-urban forests and larger recreational areas provide important functions for their users, and access to natural areas is particularly important for people living in dense urban settings, as exposure to nature can contribute to physical and mental well-being (Hartig *et al.*, 1996; Kuo and Faber Taylor, 2004; Morris and O'Brien, 2011; O'Brien and Morris, 2013; van den Berg *et al.*, 2003). Green spaces can potentially support integration processes, as landscapes and forests can create a link between the host country and the country of origin, e.g. by evoking nostalgic feelings (Jay *et al.*, 2012; Madge, 1997; Rishbeth and Finney, 2006).

Peri-urban recreation areas are usually publicly funded and therefore access should be provided for all segments of society; dismantling barriers to these places becomes a matter of justice. Even if these areas can be accessed for free, though, economic, cultural or organizational barriers can limit access for people from ethnic communities.

Study context

The Wienerwald Biosphere Park (~1056 km2) is located in the federal provinces of Vienna and Lower Austria and offers outdoor recreation opportunities for a catchment of more than 2 million inhabitants. Though the population in these two provinces is characterized by a high ethnic diversity, park managers have observed that certain minority groups are poorly underrepresented among park visitors. The research project "Attitudes and Satisfaction of Ethnic Groups regarding the Wienerwald Biosphere Park: A pilot study towards the integrative function of peri-urban protected areas" was thus commissioned by the UNESCO Man and Biosphere Program of the Austrian Academy of Sciences. This study undertakes a qualitative investigation of influences on outdoor recreation and activities of two specific ethnic communities - Turkish and Chinese.

Gaining access to ethnic communities

A transdisciplinary research approach was applied, using three stages – stakeholder interviews, focus group meetings with stakeholders, and interviews with people from the communities. Where necessary, bi-lingual researchers were employed to avoid language barriers. First, Chinese and Turkish stakeholders were identified and semi-structured interviews were conducted to gain practical knowledge about migration processes and outdoor recreation, as well as to specify knowledge gaps and topics important to the stakeholders. The stakeholder interviews also provided information about strategies for accessing potential interviewees in those ethnic communities. Stakeholders were identified from park management/ forestry, integration/diversity, cultural and health/sports organizations.

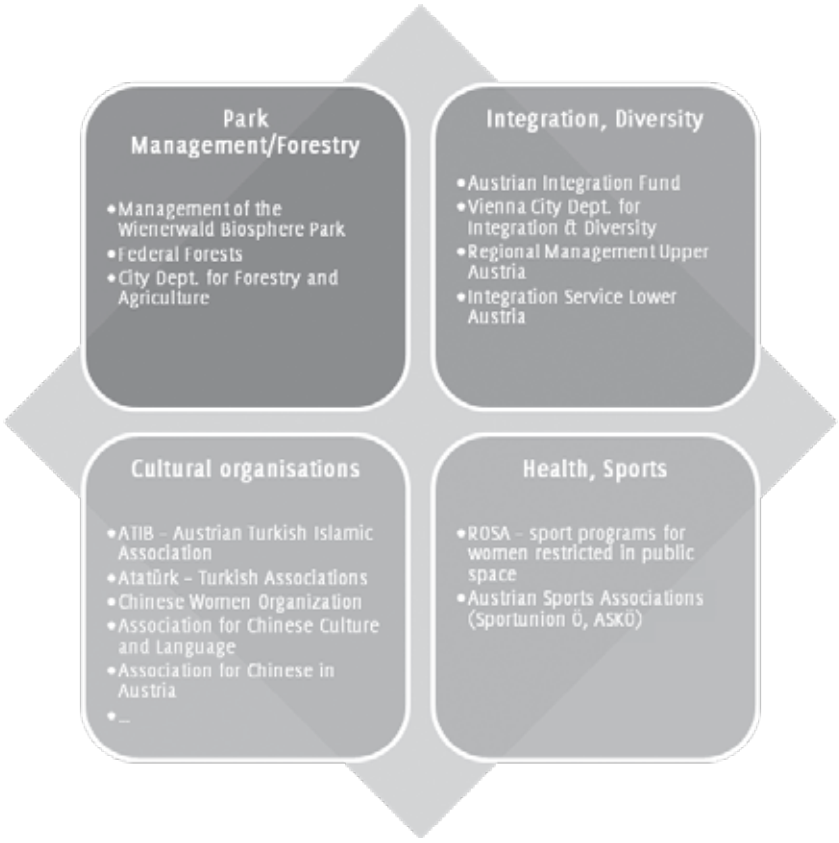

Figure 1: Examples of stakeholders involved in the research process (Höglhammer et al., 2014, modified)

Second, focus group meetings with stakeholders were conducted, with the goal to explore shared interests in research topics and to identify relevant target groups. Based on the findings and results of the stakeholder interviews and the focus group meetings, guidelines for semi-structured interviews with community members were developed.

In these first two steps, the Turkish community was relatively easy to access, as their associations are well known by administrative authorities. The Turkish Islamic Union in Austria, the rather secular Atatürk Center, and other relevant organizations were quickly identified in initial stakeholder interviews; this also included the sports initiative ROSA addressing Muslim women, who want to practice sports and health gymnastics but suffer from restrictions in public space when wearing the veil. Much less information was available about the Chinese community, and initial access was limited. Communication had to be conducted almost entirely in the Chinese language, while in the Turkish community most key stakeholders spoke German.

In the third step semi-structured interviews with individual Chinese and Turkish immigrants are being held. First interviews could already be conducted though gaining access to individual members of the two communities was quite different. So far it was more difficult to reach female interviewees within the Turkish community, particularly elderly women tended to direct researchers to speak with their husbands or other men sitting in the surrounding area. Within the Chinese community it appeared crucial to be introduced by a key person to build up trust towards the researchers; without this trust, potential interviewees sometimes misunderstood the intention of the study.

Cultural habits and notions of leisure

Interviews are on-going but preliminary results suggest that notions of leisure and its significance differ from mainstream Austrian understandings. For interviewees in both ethnic groups, there seems to be a strong linkage between immigration purpose and perception and value of leisure time For first generation Turkish immigrants, leisure has a negative connotation, and people often emphasized commitments to work over leisure. Also Chinese interviewees expressed the view that time is money and leisure is perceived as a waste of time.

Further investigation will show the impact of personal histories of immigration as well as socioeconomic and ethnic-cultural backgrounds. The relation between these findings and outdoor recreational use of peri-urban green spaces will be explored in the next phases of the data analysis, and the results will inform managerial actions in the Wienerwald Park.

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Methods for the involvement of adolescents in participation processes

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Introduction

Public space in urban environments is limited and claimed by multiple, often competing demands. Particularly for young people, public space is very important for social interaction outside parental control or school constraints (van Lieshout & Aarts 2008). They use these spaces to meet like-minded people and friends, to just hang out there or use the space as container and platform for signs and symbols of their affiliation. As teenagers experience no formal right to physical spaces of their own and have nowhere else to go than outdoor public and/or semi-public spaces, there is a high potential for conflicts with other groups (Lieberg 1995).

To examine spatial perception and appropriation of public spaces as well as to identify barriers and motifs for avoiding several places, we developed and applied methods to collaborate with adolescents at different stages based on web mapping technologies, mobile devices for recording data and spatial-related artwork (GPS drawing) to express expectations and emotions while experiencing certain spaces in a different way.

Project Background

The methods presented are developed and applied within two research projects – the already completed project *I AM HERE! - Participative approaches to analyse the space behaviour of adolescents in the city* and the still on-going project *Transforming Spaces: Breaking down social, cultural and planning barriers of Viennese adolescents in urban space utilization*. The spatial context in both projects is the city of Vienna. While *I AM HERE!* aimed at the analysis of spatial activity patterns and spatial demands of adolescents in Vienna, *Transforming Spaces* has the goal to identify areas that have a negative association among young people, often perceived an explicitly named as "No-Go" areas. The goal of both projects is the development of strategies for a city development and open space planning that respect the special needs of adolescents.

As tools for data collection, GPS devices, mobiles, digital photo- and video cameras, audio recording devices, web-mapping and virtual globe technologies are used, combined with qualitative and quantitative interview techniques. Data processing and visualization was implemented via web-mapping and virtual globe technologies.

Engaging adolescents in participation processes

We apply a set of different methods to work with adolescents mainly in a school class context with the goal to support individual preferences of expressing themselves about space, as most of the adolescents have difficulties to talk about perceptions of their everyday places (Schauppenlehner *et al*. 2012). Finding appropriate methods becomes even more important in working with school classes of adolescents, where on-going mechanisms and subliminal behaviour patterns can influence individuals, discussions and collected data.

The youth.places Web-Mapping application

WebGIS applications have progressed over the last years due to technological development and simplified access through mobile devices. In particular young people use these technologies as a matter of course in their everyday life. We developed a web-application together with adolescents named *youth.places*, to draw mental maps and to record spatially distributed data (Schauppenlehner *et al*. 2012). The application allows tagging places on a map and offers the ability to describe and categorize them using an online form. To obtain acceptance, we focus on a simple and intuitive usability and a design vocabulary familiar to young people. Points on the map can be viewed and rated; graphically processed statistics allows users to quickly identify main characteristics and coherences.

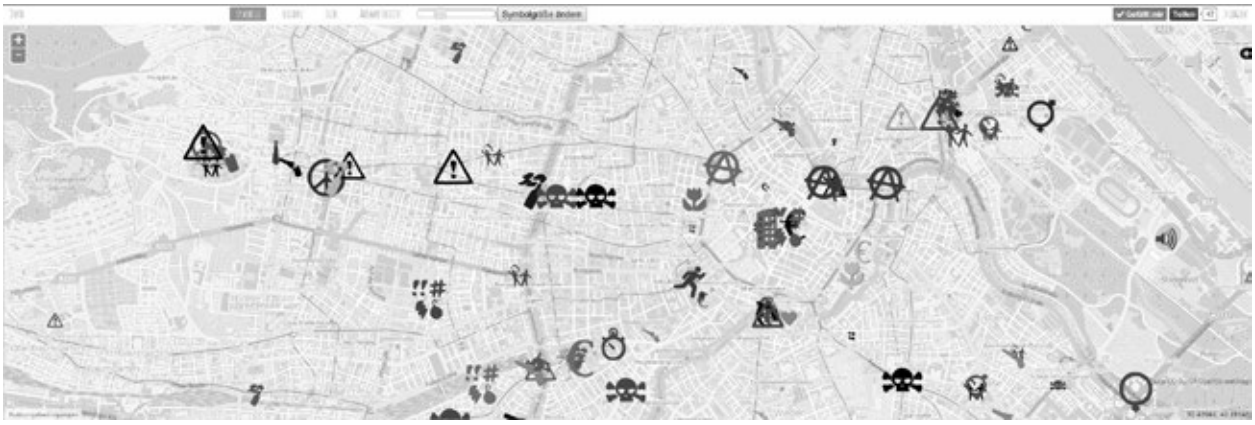

Figure 1: Main map window of the *youth.places* application

The application can also be operated on mobile devices, which facilitates spontaneous on-site interventions using QR-codes, SMS or email invitations. The users can respond directly after receiving the request, wherever they are. A geolocation tools using HTML5 and Javascript can help guide them to identify their current position on the map. Linkages to social networks should provide a platform where they can engage in discussions and use different media to express themselves (e.g. music, pictures, text, videos).

GPS drawing

In addition to the structured quantitative data gathering with the youth.places application we develop an art approach to interact with urban spaces and to provide the ability to point out messages, feelings and expectations regarding space (Schauppenlehner *et al*. 2013). The concept is based on the creation of artwork through walking (Tufnell *et al*. 2002) that was expanded into GPS drawing by Hugh Pryor and Jeremy Wood (Lauriault & Wood 2009). GPS drawing uses a GPS device as pen and the urban fabric as the corresponding piece of paper to create large-scale artworks within and depending on a specific landscape with the help of new media and technology.

Conclusions

Both presented methods allow an involvement of adolescents in research processes at different stages. Using web mapping and mobile technologies can point out new scopes for well-known tools that young people use in their everyday life. The wide spread of mobile internet offers new possibilities for research as they allow to reach people on-site or connect them via social networks. Nevertheless, technical issues like platform-depended interfaces and application still causes challenges for data integration and analysis. Social media provide a huge platform to involve more and diverse people in research processes and further give people the possibility to engage in the research process anytime. This widening requires well-designed filtering and clustering methods as participants may not fit into the target group (e.g. age classes, social backgrounds, location, messy data).

The GPS drawing project also uses mobile technologies and allows an intensive and different experience of the urban environment and specific spatial settings. By drawing a certain message or image into the urban fabric, adolescents have the possibility to discover new spots and peculiarities of actually well-known areas which can lead to rethinking processes of the daily used urban environment.

Acknowledgement

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How to rejuvenate nature parks in southern Westfalia, Germany? Challenges, methods and proposed solutions

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Introduction

The purpose of a nature park is to maintain attractive landscapes, which are frequently of a cultivated nature, as unique features. Nature parks provide areas for recreation and regeneration, but also environmental education and nature-based tourism. Their protected status should ensure the maintenance of unique landscapes shaped by sustainable, often traditional land use and local culture (Pröbstl 2004). Nature parks are the only category of protected area that targets recreation and tourism explicitly. Recreation and physical regeneration are supported by outstanding landscape beauty, and by the desired infrastructure and related facilities.

This "social category" of parks has been developed across Europe since the 1960s. A closer look on park development in Europe generally - including the new development in Switzerland - shows that the idea of model landscapes for outdoor recreation and tourism is shifting more towards a tool for sustainable destination management (Pröbstl 2008, Pröbstl 2010). Since nature parks offer excellent conditions for nature based tourism and ecotourism, their potential for regional development in rural areas is now widely discussed and explored (Job *et al*. 2005, Pröbstl *et al*. 2010). Besides the income from recreation and nature-based tourism, a nature park also offers additional opportunities for regional development, based on sustainable forms of land use, the marketing of specific local products, and cultural traditions. Many nature parks have now successfully developed local labels and brands promoting their traditional land use and its contribution to species conservation. It is crucial, therefore, to consider the interests of agriculture, regional economic development and social aspects, and to combine them into one integrated framework (Pröbstl-Haider 2013).

However, not all nature parks were able to seize these opportunities. The German Association for Nature Parks is quite aware of these discrepancies and desires to alleviate the situation by starting a quality improvement campaign and rewarding best performing parks. But what should be done if a park fails the assessment, as its quality is no longer state-of-the-art? This presentation describes the planning process, the methodological framework and the applied planning tools used in southern Westfalia, Germany, where three parks failed the assessment and attempted a joint rejuvenation.

Methods

The methodological approach was divided into two main planning processes. First local stakeholders, park managers and regional administration needed to decide whether to attempt a rejuvenation of the parks, or to abandon the title of 'Nature Park'. For this internal assessment a new methodological approach was developed. For the comparative analysis between the three parks I adapted the Herrmann Dominance Instrument (Herrmann (1989), which is used in human resources management and training to evaluate the strengths of individuals or teams. The "Park-Dominance Profile" consists of four segments: (A) legal tasks of the nature parks and its landscape setting; (B) organisation, budgetary situation, quality insurance and controlling; (C) provided image, recognition in the public, communication, and identification by the local population with the park; and (D) its creativity, innovation and diversity in outdoor recreation and tourism offers.

The second planning process focused on the development of a new park structure in a cooperative planning process. Since nature parks ought to be developed by a bottom-up approach, we based this planning task on the application of participatory-GIS, a moderated planning process with five thematic stakeholder groups and several public meetings (Brown, 2014). Furthermore for the development of new ideas for the enlarged park we used the meta-plan technique. Each meeting was based on a discussion of recent trends and ended with development guidelines and proposals for new projects.

Results

Evaluation of existing parks

The application of the Park Dominance Profile to the three parks revealed significant differences and threats. Deficiencies were mainly discovered in section B (organisation and finances) and D (the creativity and product development). Only one park showed overall positive trends. Given these findings the question emerged if one single new park would provide better opportunities to achieve the goals in the four segments. The majority of the local working group agreed that one single larger park would enhance the creativity, improve the tourism and outdoor recreation offers and facilitate the creation and implementation of innovative projects. Based on the findings in phase 1 the participatory planning process was started to define the new park, its territory and its new profile.

A new park planning process

Each of the thematic meetings on management and organisation, nature conservation, outdoor recreation and sustainable tourism, environmental education and communication and sustainable regional development consisted of 15 to 20 stakeholders and experts. First, maps of possible new boundaries of the future park were drawn. The consolidated GIS-map revealed significant overlaps, making it easy for communities and regions to agree to a new spatial concept.

In a second step each thematic group had to provide spatial information in their respective field of expertise. This input, again summarized using participatory GIS, illustrated the potential of the future park, but also identified areas, which currently offer fewer infrastructures. These data were combined with existing spatial information in the respective field. The most significant discrepancies emerged in the group meeting on regional development. For example, many interesting structures such as local farmer markets have not been considered in the past.

The final step of the planning process provided the region with the concept for new park borders which were very acceptable to most participants, new thematic guidelines, and a project database with new ideas, possible project partners and funding opportunities. The entire planning process, which included a few new methodological tools, proved to be highly valuable and enhanced the required participatory process and bottom up planning process.

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Potentials for incorporating intergenerational practices in protected areas and implications for visitor management

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Introduction

Mountainous areas in Europe are centres of natural and cultural diversity, but their inhabitants are facing a lack of opportunities for development, and limited possibility to participate in and influence local development processes, such as the development of rural tourism. This causes outmigration of the population, abandonment of rural settlements, especially by the younger generations. The latter leads to the "drain" of fresh perceptions and new skills, such as information and communication technology and entrepreneurial skills, which could prove useful to develop the rural regions.

Moreover, the greater distance and lack of interaction among the younger and older generations results in marginalization of the rural aging population and the loss of traditional knowledge, such as crafts, folklore, traditional forms of land use, and natural and cultural history of the rural areas.

Intergenerational aspects are strongly embedded into the concept of sustainable development and are becoming more relevant as the global population ages. However, the interaction among the members of different generations in the framework of the sustainable development process is not often explicitly addressed.

Intergenerational Practice

Intergenerational practice has received increasing attention, due to ageing and changing family structures. It can be defined as practice, which "aims to bring people together in purposeful, mutually beneficial activities, which promote greater understanding and respect between generations and may contribute to building more cohesive communities" (EAGLE 2008). It has for centuries provided an informal way of transferring "knowledge, skills, competencies, norms and values" within families (Newman & Hatton-Yeo 2008), and to-date has become more relevant in a broader "extra-familial" social context (Newman & Hatton-Yeo 2008). Its role is recognized in developing sustainable communities (Buffel et. al. 2013), and leading to more inclusive and cohesive societies (Newman & Hatton-Yeo 2008). This could be particularly applicable in the context of demographic changes and economic marginalization of rural areas.

Intergenerational practice in the context of protected areas

PAs, more often situated in rural areas, are supposed to counter the above processes by supporting socio-economic development of the surrounding local communities, in addition to nature conservation, preserving traditional and cultural practices, tourism development, as well as education and research. This diversity of objectives poses a number of challenges for successful PA management.

It is increasingly recognized that an important component of addressing these challenges is the integration of local values and perceptions into PA management (Zanon and Geneletti 2011), participation and co-management by the local stakeholders (e.g. Berkes 2009). Some of the factors associated with successful participatory conservation initiatives have been shown to be: creating or enhancing social capital, engaging with local cultural traditions, institutions, and leaders, and ensuring local participation in project initiation, design, and daily operation (Brooks et. al. 2013).

Intergenerational practice (IGP) has been shown to enhance participation and improve social cohesion. As such, PA administrations could benefit from IGP with respect to their role in community development, as well as enhancing participatory management, and implementation of their other multiple tasks, such as visitor management.

Research Questions

This paper aims at discussing implications of IGP for visitor management in protected areas, via the following research questions: (1) What challenges of PA management are related to the tasks of visitor management? (2) How can IGP help address these Protected Area management challenges? and (3) How can IGP be implemented as part of PA visitor management?

Research Setting and Methods

The paper is based on the working experience of the first author as a consultant in the UNEP Vienna Office – Interim Secretariat of the Carpathian Convention (The Framework Convention for the Protection and Sustainable Development of the Carpathian Mountains). Practices and experience under the Carpathian Convention could be considered as a showcase of the sustainable regional mountain development initiatives on European level.

This paper summarizes investigations of several activities and partners of the Carpathian Convention, namely: (1) the Carpathian protected areas, members of the Carpathian Network of Protected Areas (CNPA), (2) the project "Big Foot. Crossing generations, crossing mountain" (2011–2013), which aimed to establish intergenerational learning activities in three rural mountain communities, located respectively in Bulgaria, Greece and Italy, and (3) the project "Innovation in Rural Tourism" (2012-2015), which aims at developing innovative training and promotional materials, and training local tourism stakeholders in community-based sustainable tourism development in Romania, Ukraine, Poland, Italy and Austria.

Intergenerational practice examples were investigated, with a special attention to their application in rural mountainous areas and PAs: (1) examples of intergenerational practice were collected from literature; (2) Case-studies of the projects "Big Foot. Crossing generations, crossing mountains" and "Innovation in rural tourism" were examined and (3) data on intergenerational practice in protected areas in the Carpathian Mountains were collected via interactive open – ended expert interviews, through the network of the Interim Secretariat of the Carpathian Convention, and the Carpathian Network of Protected Areas.

Results - Implications for visitor management

The results suggest that IGP could be applied in visitor management in protected areas in the following proposed ways: (1) developing offers for the local population and (2) cooperating with the local community on promoting sustainable tourism development.

In case of the former, PAs could develop activities, suitable for people of younger and older ages, and focused on attracting intergenerational groups. This could be done through organization of training courses and events, related to various PA objectives or via volunteer programmes, in cooperation with the local schools and/or retired professionals.

With respect to the latter, IGP can be focused on local tourism development, by using the knowledge and practices of traditional culture, crafts and recipes of the older population, and at the same time, adding innovative aspects attractive to younger and older tourists, and promoting the offers via new media with the help of the younger generations.

The proposed above applications of IGP to PA visitor management are presented in Table 1, with specific solution pathways offered by IGP, which contribute to these applications, outlined.

Table 1. Proposed Application of IGP to PA Visitor Management

Application of IGP to PA visitor Management	**Potential solution pathways offered by IGP, applicable to PA Visitor Management**

1. Development of offers for the local population: both for younger and older ages, as well as inter-generational groups
 	
• organization of training courses and events, related to PA objectives
• volunteer programmes, in cooperation with the local schools and/or retired professionals.
	• The older generation can teach conservation values to the youth
	• The younger population can easier accept the PAs, due to more awareness via school programs; IGP can help transmit these values to the older generation;
	• IGP can facilitate raising local youth interested in conservation and trained as conservationists
	• The IGP process can facilitate:
	  • park ranger training for the local people
	  • involving students in data collection as a part of IGP education activities
	  • voluntary work by local communities in PA management
	• IGP can enhance education activities and strengthen their impact on community cohesion
	• Research and interest in conservation can be promoted more among the younger people by the older professionals, via cooperation of PAs with the Universities

2. Cooperating with the local community on promoting sustainable tourism development.
• using the knowledge and practices of traditional culture, crafts and recipes of the older population,
• adding innovative aspects attractive to younger and older tourists
• promoting the offers via new media with the help of the younger generations
	• IGP can facilitate:
	  • adapting traditional knowledge to the current situation
	  • sustainable tourism development
	  • creating community natural spaces based on the local lands-cape and vegetation
	  • combining traditional knowledge with innovative ideas, new media and ICT
	• IGP can support involvement of adults via the younger generation, and vice-versa, including via volunteering programs
	• IGP can enhance community participation, such as via school programs in cooperation with PAs, local seniors and cultural organizations
	• IGP can strengthen community cohesion and sense of ownership

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Developing a tourism zoning concept for the cross-border Morava-Dyje floodplains based on species sensitivity and stakeholder participation

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Introduction

The European Green Belt is comprised of valuable nature conservation areas with a high biodiversity of flora and fauna, which were left undisturbed except for some land use during the Cold War. Since the fall of the Iron Curtain in 1989 the Green Belt area between Austria and Slovakia has also provided recreation potential for millions of people who live in or near the "twin cities" of Vienna and Bratislava. The cities are only 60 km apart and connected by the floodplains of the Danube and Morava Rivers. In 1996 the Danube floodplains were designated as a National Park with an authority to regulate excessive recreational and touristic use by appropriate visitor management. No such measures have been applied to the Morava-Dyje floodplains as yet. This is despite its internationally recognised importance as a Trilateral Ramsar Site (together with the adjacent Czech area) as well as a Natura 2000 area.

This recent project aimed to address the intentions of the municipalities along the Green Belt to boost their economic development with nature-based tourism. While recreational activities may be an opportunity to raise people´s awareness of biodiversity, they may also pose threats to sensitive habitats and species.

In this bilateral project ("Ramsar Eco NaTour"), which was facilitated by the European Cross-border project funds (ETC AT-SK), sensitive as well as suitable areas and activities for nature-based tourism were identified. The process adopted a two-way approach: analysis of scientific data of the distribution of sensitive species and habitats, as well as participatory workshops to identify and locate residents` needs and visions for touristic and infrastructure development. The combination of both methods resulted in a zoning plan, which is intended to create a basis for future tourism development. This paper presents the first results.

Methods

Participatory collection of tourism data

The first step towards creating a zoning map in GIS consisted of collecting all available data on existing tourism- and environmental-education-related activities and infrastructure in the Austrian and Slovak areas. Large map prints (scale of 1:20.000) were provided for the use in participatory workshops. The workshops were held in communities in the region and mainly addressed stakeholders, but were also open to the public. A metaplan-technique (Schnelle 1991) was first used to collect people´s assessments of current activities and infrastructure, general ideas and proposals for future development, as well as "favourite places for personal experience". In the second step participants were asked to locate their inputs on the analog maps ("PGIS", or participatory GIS, Brown & Kyttä 2014). Preliminary results were presented to and discussed with the participants at the end of the workshops.

Collection and evaluation of nature conservation data

For the designation of zones, index species and habitats were assessed to fulfil two criteria: (1) priority species/habitat in terms of legal obligations or international treaties (Natura 2000, federal protected areas, Ramsar), and (2) sensitivity of the species or habitat to disturbance by the relevant touristic activity or infrastructure. The mapping of the index species and habitats was based on surveys and/or telemetric data (for tree-nesting birds, river-breeding birds, river morphology, habitat surveys, etc.) and meta-data from spatial planning processes (Alpine-Carpathian corridor, wind farm exclusion zones based on birds and bats). Parallel to this data collection, workshops with experts (biologists and landscape planners) were held to specify areas of particular importance on the basis of their local knowledge.

Production of zoning maps

The degree of species importance and sensitivity, as well as the experience factor, determined the classification into "protection zone" (areas where further touristic activity or infrastructure is not recommended), "experience zone" (areas with high experience value but also potential disturbance, where most developments would be subject to impact assessment) or "white zone" (with no restrictions besides the existing legal framework). The participatory input on recreation was mapped as "experience point" and "wish or proposal". For the discussion process, this input was displayed regardless of a potential

overlap or conflict with nature conservation interests.

In total, nine workshops were held in the regions. Participants included mayors and other council representatives, tourism officials, nature conservation authorities and regional development agencies at various levels, land users, tourism enterprises, nature conservation and environmental education NGOs, etc.

Results: The zoning map

A concept for the development of nature-based tourism as well as a monitoring system (e.g. visitor management system) had been lacking the region so far. Thus, a draft concept was compiled to put the outcome of the participatory workshops into perspective. This concept identified target groups (families, 50+) and lifestyles (LOHAS, DINKS) as well as potential key tourist attractions (cycling, walking, canoeing, bird watching, environmental education).

The zoning map showed clearly that the experience value is the highest at the outskirts of the protection zone, because of the beautiful scenery and the spectacular species to be seen (such as white stork and other large bird colonies, nests or feeding grounds), as well as the relative ease of access. It also showed that new activities could be located just outside the protection zone if adaptation measures are applied to minimise disturbance (such as enclosed hides for bird watching).

Two potentially serious areas of conflict were revealed: cycling routes and canoeing. The (re)location of cycling routes has been reason for controversy within the area for years, since the existing Austrian routes (mostly on roads) are not attractive or safe for cyclists. Many cyclists prefer to use the routes along the Slovak side of the river. In the absence of bridges to allow regular border-crossings, the Austrian side loses out on potential tourists. It became apparent that necessary factual and background information is lacking in the municipalities, but “nature conservation” is often used as a scapegoat for deficiencies. The zoning map showed that re-routing would not harm nature-conservation goals in many places and compromises could be found.

Outlook

The approach of using scientific data combined with a participatory method seemed to open up new perspectives for the people involved in the process. It may even lead to a new culture of communication and should provide a framework to include authorities, stakeholders, residents and NGOs in the cross-border planning processes and the development of new projects.

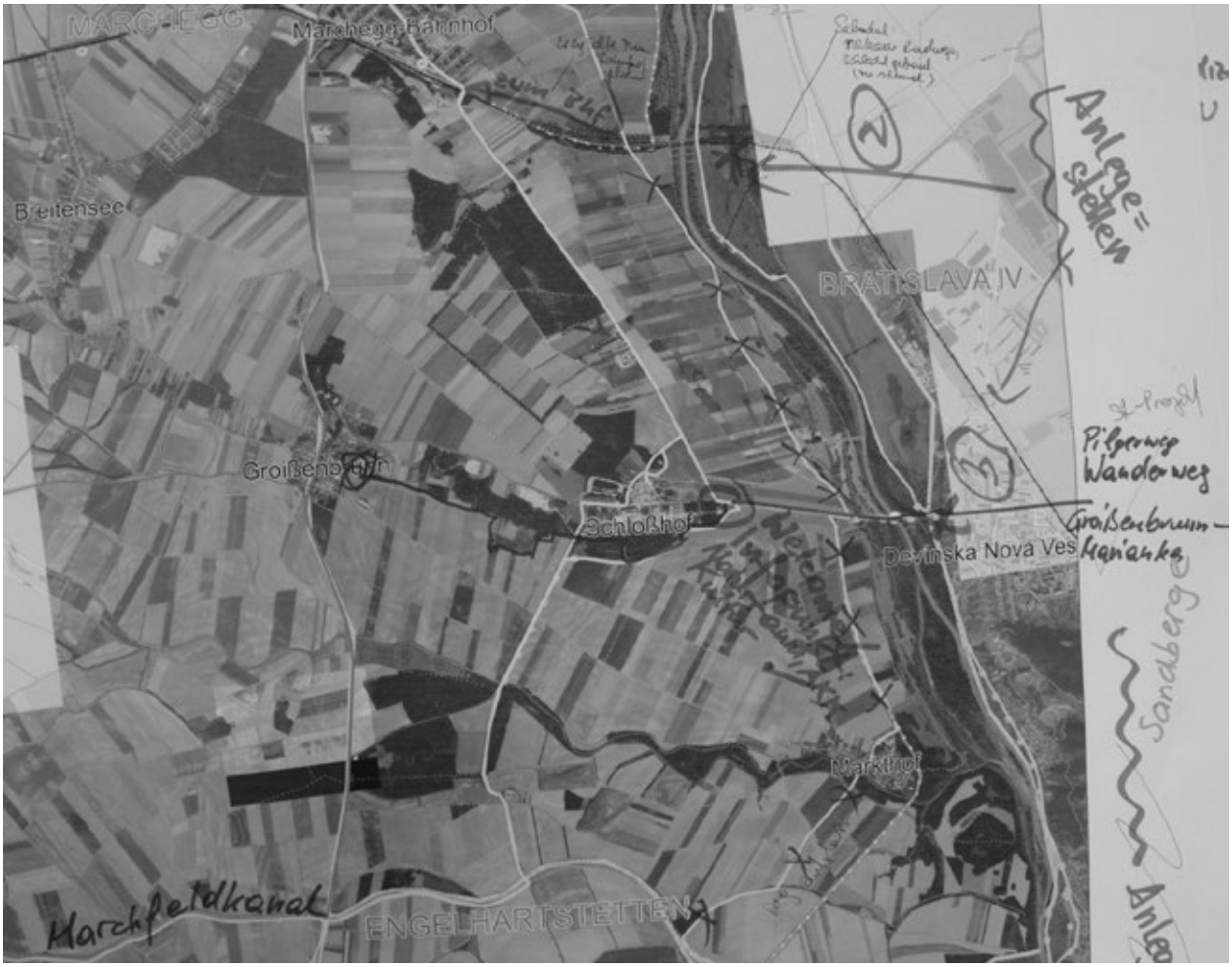

Fig. 1. Section of a working map resulting from a PGIS-Workshop (17.2.2014).

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SESSION 1D INTEGRATING OUTDOOR RECREATION AND NATURE CONSERVATION

Modelling current and future recreational demand in rural England; the development of tools to mitigate against potential conflicts with biodiversity

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Outdoor recreation is popular worldwide and demand is on the increase (Patthey *et al.* 2008). The situation in the UK is no exception (Sen *et al.* 2014). Although outdoor recreation improves mental and physical wellbeing (Pretty *et al.* 2007), there is an abundance of evidence of its adverse effects on biodiversity, whether direct (e.g. trampling (Liddle 1991)) or indirect (e.g. reducing breeding bird success (Liley & Sutherland 2007; Mallord *et al.* 2007)"title" : "Predicting the population consequences of human disturbance for Ringed Plovers Charadrius hiaticula: a game theory approach", "type" : "article-journal", "volume" : "149" }, "uris" : ["http://www.mendeley.com/documents/?uuid=d6b9d48b-169f-4455-a62e-6544e5d4ac73"] }, { "id" : "ITEM-2", "itemData" : { "DOI" : "10.1007/s00442-007-0716-0", "ISSN" : "0029-8549", "PMID" : "17479296", "abstract" : "Although density dependence has long been recognised as vital to population regulation, there have been relatively few studies demonstrating it spatially in wildlife populations, often due to the confounding effects of variation in habitat quality. We report on a study of woodlarks Lullula arborea, a species of European conservation concern, breeding on lowland heath in Dorset, England. We take the novel approach of utilising the birds' response to human disturbance, which resulted in much of the variation in density but had no direct impact on demographic rates. Within years, in sites with greater density there were smaller mean chick masses, lower post-fledging survival, and higher rates of nestling mortality attributed to starvation. The effects on clutch size and fledging success were confounded by the area of grassland within a site. There was no effect on brood size. Density dependence also operated within sites between years: as density increased there were reductions in mean chick mass and post-fledging survival, while nestling mortality attributed to starvation increased. Density-dependent effects on clutch size were only weakly regulatory, whereas density-dependent starvation and post-fledging mortality rates contributed strongly to differences in overall breeding output. Heavier chicks (when 7 days old). Globally increasing human populations and urban spread are contributing to greater recreational pressure on natural habitats (Sharp *et al.* 2008; Clarke *et al.* 2013)including the stone curlew (for which it holds more than 60% of the UK total population. Therefore, the need to mitigate such adverse effects on biodiversity is becoming even more urgent.

The aim of this current research is to investigate the spatial distribution of recreational pressure across England using a national level recreation model. This model is then used to predict the outcome of future projected increases in population and house building upon recreational visits to rural areas. Using this model we then test a range of mitigation strategies to reduce pressures on highly visited sites. These include the provision of alternative green space to relieve pressure on important conservation areas and altering footpath density at highly visited locations. Various scenarios at national, regional and local scales are explored.

The recreation model was developed through comparison of 31,550 geo-referenced recreational visits against 63,100 randomly selected countryside locations (controls) representing potentially available sites (Manly *et al.* 2002). Observed visit sites were taken from the Monitor of Engagement with the Natural Environment (MENE) survey (2009-2012) (Natural England 2012), an extensive, year-round, England-wide 3 year data set from in-house interviews of visits to the natural environment. The likelihood of a site being visited was modelled using information on land cover (Morton *et al.* 2011), path network density (OpenStreetMap 2013) and mean elevation (OST50 2013), controlling for size of surrounding visitor source populations (ONS 2011) and potential regional differences in behaviour. Predictor variables were generated in ArcGIS 10.1 (Copyright © ESRI, USA) and analysis by a generalised linear mixed model with binomial error was performed in R (version 3.0.2).

The best-fit recreation model indicates a preference for high path density and low elevation (Table 1), as expected due to accessibility and preference for flat, lowland areas respectively. Coastal and freshwater sites exerted the greatest attraction on recreationists followed by broadleaved woodlands (Table 1). All other land cover types, including semi-natural grassland,

heathland and arable land reduced the probability of a site being visited by recreationists.

Table 1. Best-fit model predicting recreational demand in the English countryside, controlling for region. Dependent variable: the likelihood of visitation

	Standardised Coefficient	Std. Error	t	p
Non-land cover variables				
Path length	0.8231	0.0143	57.5772	<0.001
Built up	0.7088	0.0247	28.7093	<0.001
Population	0.4445	0.0221	20.1201	
Elevation	-0.3307	0.0157	-21.1087	<0.001
Land cover types with positive effect				
Beaches	0.2834	0.0164	17.2289	<0.001
Freshwater	0.1713	0.0110	15.5400	<0.001
Cliffs	0.1583	0.0144	11.0049	<0.001
Broadleaved	0.1549	0.0175	8.8439	<0.001
Land cover types with negative effect				
Arable	-0.5585	0.0364	-15.3577	<0.001
Upland	-0.1128	0.0204	-5.5299	<0.001
Improved	-0.0898	0.0264	-3.3957	<0.001
Lowland	-0.0893	0.0127	-7.0143	<0.001
Coniferous	-0.0790	0.0139	-5.6749	<0.001
Semi-natural	-0.0557	0.0171	-3.2579	<0.01
Constant	-0.9514	0.1476	-6.4478	<0.001
Observations	94,650			

To extrapolate from our survey sample to produce an England wide map of recreational demand, England was divided into a grid of 800 m cells (approximately 207,000 cells), predictor variables used to fit the recreation model were extracted for each cell and the probability of visitation predicted from the estimated coefficients from the recreation model. The annual number of visits to each cell was predicted by rescaling the predictions of visitation probability, using an estimate of the total annual number of recreational visits across England (provided by Natural England 2012). This provides the first mapped distribution of recreational pressure across England.

This model was then used as a planning tool to assess the consequences of urbanisation and demographic change on a national and regional scale. National and regional population projections were examined and used to produce new population distribution maps for two future time periods 2030 and 2050. These future populations were then used to create new maps showing the spatial distribution of recreational pressure under future scenarios of population growth and urbanisation for 2030 and 2050. The final stage in the analysis examined potential strategies to mitigate against the projected increases in recreation pressures. We used the predictive model, which incorporates land use effects, to show how recreational pressure can be redistributed to relieve pressure on important conservation areas by provision of alternate recreational habitat as mitigation. We experimented with different configurations of alternative sites (e.g. one large site versus a larger number of smaller and more spatially disaggregated sites). The findings will be discussed with reference to strategic planning and policy.

Acknowledgments

This research was funded by a Natural Environment Research Council Ph.D. Studentship.

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Nature excursions in the Dutch Wadden Sea: tools to integrate tourism, outdoor recreation and nature protection in a natural World Heritage site

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The international Wadden Sea is an estuarine tidal area along the North Sea coasts of The Netherlands, Germany and Denmark. It is characteristic for regions with sandy coasts and a medium tidal range. Fifty barrier islands separate the Wadden Sea from the North Sea, and an offshore transition zone to the North Sea. The tidal flats of the Wadden Sea form the largest unbroken stretch of mudflats worldwide. The present form of the Wadden Sea is still mainly the result of natural forces, although since the Middle Ages man has changed the Wadden Sea landscape by building dykes and reclaiming land. The Wadden Sea is an important nursery area for fish, a foraging and resting habitat for seals, and a foraging habitat for migrating waders. The Wadden Sea, including large parts of the islands, is a fully nature protected area and designated as a natural World Heritage site in 2009 (Wolff, 2013). The research group Marine Wetlands Studies at Stenden University is focusing on the sustainable development of tourism in the area. Current research has the purpose to get insight in to the effects of the World Heritage Status, in particular the natural values of the area, on future tourism development.

Map of the international Wadden Sea area (source: http://www.waddensea-worldheritage.org/)

It took more than 10 years to reach the necessary consensus to nominate the Wadden Sea as a World Heritage site. Especially local communities and economic interest groups feared a loss of autonomy and legal constraints for their activities (van der Aa, *et al.*, 2004). Also the great societal changes during the last 50 years in this region should be mentioned in this context. Traditional employment, which was found in the agriculture and fisheries, was replaced by employment in the tourism and recreation sector (Sijtsma, *et al.*, 2012). The Wadden Sea, which provided income (fishing, seal hunting), which also threatened local communities (floods), became an icon of nature protection. The need to protect the unique natural values of the Wadden Sea area as such is not subject to debate. But at the same time it raises the question to what extent the values of nature and landscape can contribute to the socio-economic development of the area (Revier, 2013).

The World Heritage Status of the Wadden Sea, as decided upon by the World Heritage Committee of UNESCO on the 26th of June 2009 in Sevilla, was in the end supported by most stakeholders in the Dutch and German Wadden Sea. Many local entrepreneurs believed that high natural values are important requirements for the tourism development in the Wadden Sea region. They also assumed that the nature and landscape of the Wadden Sea could be the main pull factor for the tourism development in the coastal regions of Friesland and Groningen. During the 14th Governmental Conference on the protection of the Wadden Sea the responsible Ministers adopted a strategy for the sustainable development of tourism. Developing and promoting authentic nature experiences to maintain current visitors and attract new target groups are one of the challenges in this strategy.

To get more insight into the effects of the World Heritage status of the Wadden Sea quantitative and qualitative research among stakeholders and visitors of the Wadden Sea in the fall of 2008, the spring of 2009 and at the end of the summer of 2013 were carried out. Visitors to the harbour city Harlingen in the Netherlands were asked about their knowledge and expectations of the World Heritage nomination of the Wadden Sea. Also stakeholders in the Dutch and German Wadden Sea (representatives of the municipalities, restaurant-owners, entrepreneurs) were questioned. The main results of these studies indicate that awareness about the World Heritage status has grown (30% in 2008, 74% in 2009 and 75% in 2014). But only for a small majority (around 50%), the World Heritage status is a reason to visit the area (Revier, *et al.*, 2012). Due to the nomination, stakeholders in the tourism industry expected an increase of tourism and a positive added value to the image of the Wadden Sea. On the other hand they are not well prepared and are waiting for initiatives by the (local) government. Possible marketing opportunities have not been taken into consideration from most of the tourist facilities and municipalities either (Revier, 2013).

Several authors underline that visitors to the Dutch Wadden Sea area appreciate the natural landscapes on the islands (beaches and dune areas) the most. The Wadden Sea itself is of lesser importance (Sijtsma, *et al.*, 2012). Nevertheless the ecological values of the Wadden Sea can play a role in the tourism development. The results of a survey among participants of nature excursions demonstrated that wildlife was an important factor in shaping visitors' attachment to the Wadden Sea area (Folmer *et al.*, 2013). Seeing birds contributed most to visitors' attachment, while seeing seals and small marine wildlife mattered most respectively for participants of seal excursions and educational Wad excursions. Nature excursions can therefore be regarded as important tools to foster and increase visitor attachment to protected areas, by facilitating encounters with wildlife in its natural habitat (Folmer *et al.*, 2013). A smaller survey among participants of excursions, especially aimed at the values that qualify the Wadden Sea as natural heritage area and organised in close cooperation with local entrepreneurs, confirm these outcomes.

Overall the conclusion can be drawn that, stimulated by the World Heritage status of the Wadden Sea and facilitated by a trilateral Sustainable Tourism Strategy, tourism development and nature conservation can mutually benefit. Nature excursions raise awareness about the natural values of the Wadden Sea, resulting in more visitors to the region and contributing to an emotional attachment to the protected area and more public support for the conservation programs.

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Leisure activities - a red rag for wildlife management and nature conservation: an indicator- and spatial planning-based approach for identification of conflict areas

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Leisure as well as recreational activities are often a red rag for wildlife management and nature conservation. The numbers of visitors in recreational areas as well as in nature conservation areas are rising, as is the number of different leisure activities and their demands on landscape and habitats of wildlife species. As a consequence, interactions between leisure activities and requirements of wildlife species are increasingly often a source of conflicts.

The complexity of human-wildlife conflicts calls for innovative, integrated and foresighted approaches to conflict management that are based on objective data and transparent analysis of those conflicts. The study "IESP - Towards Integrated Ecological Spatial Planning for the Wienerwald Biosphere Reserve" developed a professional and methodical basis for anticipatory management of conflicts. The main objective of the study was to develop and demonstrate an integrated spatial planning framework for the management of conflicts between recreationists and wildlife in the Wienerwald Biosphere Reserve in Austria. The study was based on an interdisciplinary and participatory research design as well as on geographic information system (GIS) assisted methods to identify and assess human-wildlife conflict potentials in a spatially explicit way.

Methods

The research team used a two-fold indicator approach, one for wildlife and one for recreation activities: Significant Indicator Species (SIS) and Significant Indicator Recreation Activities (SIRA). Both fulfil umbrella functions for other species and activities. In collaboration with local experts the following hunted and protected animal species were selected as SIS: Red Deer (*Cervus elaphus*), Wild Boar (*Sus scrofa*), Black Stork (*Ciconia nigra*), Capercaillie (*Tetrao urogallus*), and Ground Squirrel (*Spermophillus citellus*). The selected SIRA represent recreation activities that are practised frequently in the region and have a high ecological disturbance potential: mountain-biking, jogging, geocaching, activities with dogs, and ballooning. Knowledge on the distribution of SIS in space and time was gathered by in-depth interviews with local experts and from hunting bag statistics and monitoring data. The spatio-temporal distribution of SIRA was modelled as "recreational use probability" in a GIS environment, based on driving factors in the source and target areas of recreationists derived from e.g. empirical socio- and psycho-demographic profiles, population densities, infrastructure network, landscape suitability attributes, and behavioural preferences of each group. By overlaying GIS layers on SIS (habitat use, population density, connectivity) and SIRA (distribution, use intensities), spatial conflict potentials were identified and then validated with the help of stakeholders.

Results

The results of the study include profiles and characteristics of indicator wildlife species and of indicator recreation activities. Furthermore, the habitat situation and spatial distribution of the SIS as well as the intensity, spatial distribution, and likelihood of occurrence of the SIRA have been identified. A methodical toolbox for GIS-based modelling of the potential occurrence of recreation activities and for spatial analyses of conflict potentials has been developed and prepared for future applications.

Results of the analysis were used to elaborate a catalogue of action strategies and conflict management measures. The recommendations cover measures and decision support for visitor management, communication, information and public relations, prioritisation of spatial aspects and for monitoring of conflict potentials and adaptive management.

Measures proposed range from such on small scale basis as e.g. visitor management measures making sensitive areas less attractive for visitors as well as measures on a larger scale as e.g. land use planning (settlement development...), planning of infrastructure or modes of transport.

In addition, strategic recommendations for the usage of the study results within the Wienerwald Biosphere Reserve as well as for participative follow-up proceedings to implement spatial and ecological conflict management in practice have been provided to the stakeholders.

The results of the analysis, including sets of GIS-based maps, are valid specifically for the Wienerwald Biosphere Reserve (fig. 1). The methods for modelling and analysing conflict potentials, many recommendations for action as well as the conceptual framework to combine measures and spatial analysis of conflicts are transferable to other areas.

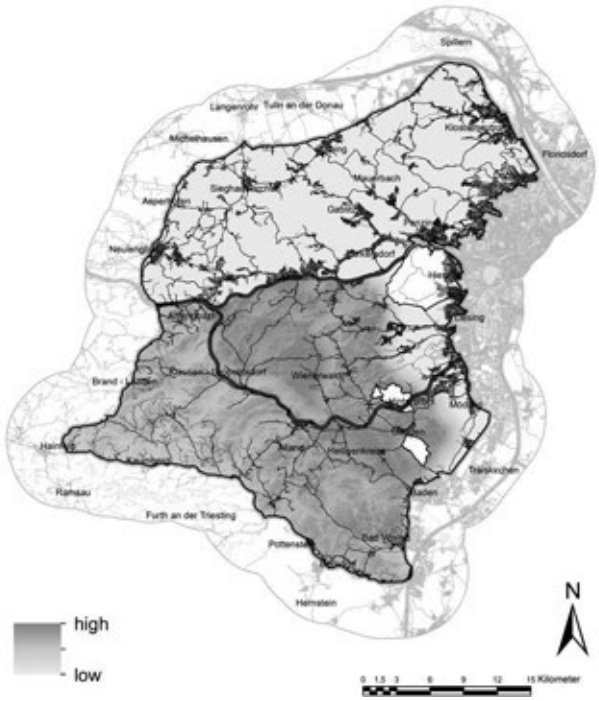

Figure 1: Areas of Conflict Potentials between Red deer (*Cervus elaphus*) and mountain biking (Reimoser et al. 2012)

Project results are communicated to target groups within and beyond the Wienerwald Biosphere Reserve. These include stakeholders that have a role in the emergence of conflict potentials, are affected by the consequences of conflicts, may influence the management of conflicts, or have an interest in their resolution.

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The effect of wildlife-protection measures on winter-sports behaviour

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Introduction

The appearance of outdoor recreation activities has increased significantly all over the world (Manning & Anderson, 2012) as well as in Switzerland (Hunziker *et al.*, 2011). This development can lead to conflicts between winter-sports participants and native wildlife populations in subalpine areas, where protected species like the capercaillie (*Tetrao urogallus*) can be affected (Arlettaz *et al.*, 2007; Ingold, 2005; Thiel *et al.*, 2011). Therefore, to reduce the negative impacts on nature and wildlife populations, it is important to manage outdoor recreation, especially the activities of winter sports participants, while preserving high levels of recreation value. The nationwide campaign "Respektiere deine Grenzen" tries to accomplish this by steering the behaviour of people who engage in ski-touring and snow-shoeing in order to diminish the negative impact on native wildlife populations, especially in protected mountain areas.

However, it is not well known yet, if such steering instruments actually influence behaviour in a positive way. Therefore, this study aims to evaluate the effectiveness of the campaign in Switzerland. Furthermore, the evaluation enables to obtain knowledge about how to develop steering instruments for managing outdoor recreation in general. To reach this aim, the following research questions were to be answered:

- What are the significant influencing factors on the desired behaviour of people who engage in ski touring and snow-shoeing?
- What role does the "Respektiere deine Grenzen" campaign as a whole, with its general purpose "raising awareness" and with all its communicative measures, play in influencing the behaviour of winter-sports participants?
- What effect do on-site interventions instruments (marking of protection zones, by barrier tapes and prohibitive signs) have on the behaviour of the winter-sports participants?

Methods

To answer research questions 1 and 2, i.e., to achieve knowledge about the impact that the influencing factors have on behaviour and about the role of the campaign in general with its strategy of raising awareness, a survey was conducted at the starting points for ski and snow-shoe tours in six study areas within the Swiss Alps.

To answer research question 3, i.e., to obtain knowledge about the effectiveness of the on-site intervention instruments, the six areas were selected according to a treatment-control experiment design, i.e., the six areas represent different levels of protection-zone density and of presence of barrier tapes and prohibitive signs, allowing a comparison of the athletes' nature-protection related behaviours and interpreting it as a result of the on-site intervention measures.

Results

The analysis of the assumed predictors for behaviour using multiple regression models shows that the campaign has significantly positive impacts on behaviour (Fig. 1): People who know the campaign and its communicative content more often state that they behave in accordance with the four campaign-mediated rules than people who do not know about the campaign. Furthermore, solution knowledge, which is also mediated by the campaign has positive impacts on the stated behaviour.

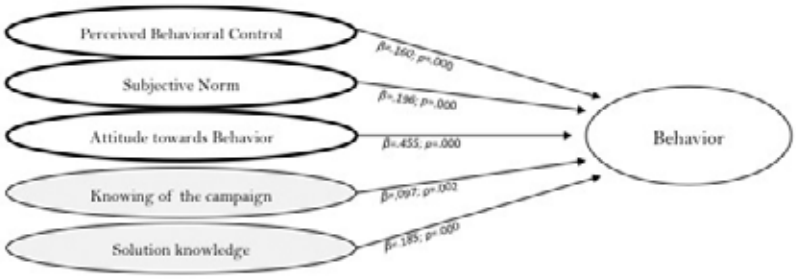

Figure 1: Significant predictors for stated nature-related behaviour of ski touring and snowshoeing according to multiple regression models. Perceived behavioural control, subjective norm, and attitude towards behaviour are defined based on the theory of planned behaviour (Ajizen 1991). Knowing the campaign is self-explaining, solution-knowledge means the knowledge how one can actually behave in a nature-related way.

The effectiveness of the on-site intervention instruments was evaluated using U-tests, based on Kruskall-Wallis. We aggregated the six study areas into a "treatment" area, a "control-1" area, and a "control-2" area, and then we analysed the differences of the stated behaviour between these aggregated areas. The analyses revealed that the stated nature-protection related behaviour did not significantly vary between treatment and control areas, i.e. that the on-site intervention instruments did not show an effect on the stated nature-related behaviour, whereas knowledge of the communicative contents of the campaign did so.

Management implications

As attitude towards behaviour was revealed to be the strongest influencing factor on behaviour, steering instruments should, generally, try to influence the attitudes by informing, educating, and persuading the target groups in a tailor-made way. Solution knowledge as well as subjective norms are two other variables that are initial points for persuasion. This might be especially promising for target groups, such as the free-riders, whose attitudes can not be influenced easily. The presentation of role models show that the desired behaviour might, hopefully, convince peers. The result that on-site intervention instruments (barrier tapes and prohibitive signs) seem not to have an additional effect on behaviour suggests that winter-sports participants are more readily influenced during the planning phase of touring or at least at its starting point, but not when they have already decided where to go.

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SESSION 2A IMPACT OF RECREATION AND TOURISM TO LOCAL COMMUNITIES

Community perspectives to tourism impacts in conservation areas: case studies from Finland, Latvia and Lithuania

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Introduction

The main aim of protected areas is protection of natural heritage. Yet, sustainability of nature conservation is based on the quality of awareness-raising and involvement of society on all levels. Tourism, if developed sustainably, provides a number of means to achieve this goal. However, growing use of protected areas for tourism requires increased engagement for the communities living in and around these areas in the trade-off between the benefits they receive from tourism and the negative consequences they feel tourism development may cause (Sharpley 2014).

Aiming to successfully manage protected areas in collaboration with local communities, management agencies have sometimes made use of management tools such as European Charter for Sustainable Tourism (ECST). However, there is limited information available on their effectiveness. Thus, systematically collected information is often required. Information is especially needed to identify residents' perspectives, since from planning perspective, understanding residents' perceptions of tourism impacts is argued to be even more important than understanding the factual impacts (McGehee and Andereck 2004).

Although successful and effective protected area management requires stakeholder involvement (Eagles *et al.* 2002), time and financial resources may limit collaboration with local communities. Grönholm and Berghäll (2007) have stated that lacking information on protected areas management issues and local needs can cause mismatch, mistrust and conflicting views between authorities and communities. This has resulted in challenges for the sustainability of protected areas' management and community participation.

Based on these challenges the project "Community Programme for Sustainable Tourism" aims to increase the managerial knowledge of residents' perceptions towards tourism and nature conservation and to enhance local involvement in natural resource management. This paper aims to present perceived impacts of tourism based on surveys conducted in Koillismaa region in Northeastern Finland, Kemeri National Park in Latvia and Grazute Regional Park in Lithuania.

Study Areas, Methods and Materials

Koillismaa region comprises Kuusamo and Taivalkoski municipalities and Oulanka and Syöte National Parks, among several other protected areas. Tourism in the Koillismaa region, especially in Kuusamo area, has a tradition of over a century. Nature tourism has started to develop only in recent decades in Kemeri and Grazute, following the establishment of the protected areas. In Koillismaa region, the local communities are positioned outside the protected areas whereas in Kemeri and Grazute several of those are located inside the parks. The surveyed local communities have contrasting histories of land use, land ownership, conservation, and tourism development.

The research was conducted simultaneously in the case areas in late 2013. In Koillismaa region the survey was implemented as a postal survey repeating partly the study arrangement of 2002-2003 (Rämet *et al.* 2005). The sample included 397 respondents from Kuusamo and 195 from Taivalkoski. In Kemeri and Grazute the survey was carried out as a door-to-door survey, resulting in a sample of 321 respondents in Kemeri and 233 respondents in Grazute. Stratified sampling design was applied in all case areas to ensure spatial representativeness of the samples.

Survey datasets were analysed using statistical methods: presenting key figures and relative frequencies of findings.

Findings and Conclusions

The results show that most of the respondents among the populations in Koillismaa region consider that tourism has positive impact on employment, international appreciation of the area and service availability (Figure 1). Respectively, respondents among the populations in Kemeri and Grazute reported significantly lower positive impacts. Despite the relatively low perceived positive impacts of tourism in Kemeri and Grazute, the results indicated that majority of the respondents consider tourism development important for the future. More than half of the respondents among the surveyed populations in Kemeri and Grazute considered that tourism has negative impacts on littering or pollution. Perceived environmental impacts were slightly less critical among the populations in Koillismaa region, although respondents in Kuusamo perceived somewhat higher negative impacts than those in Taivalkoski.

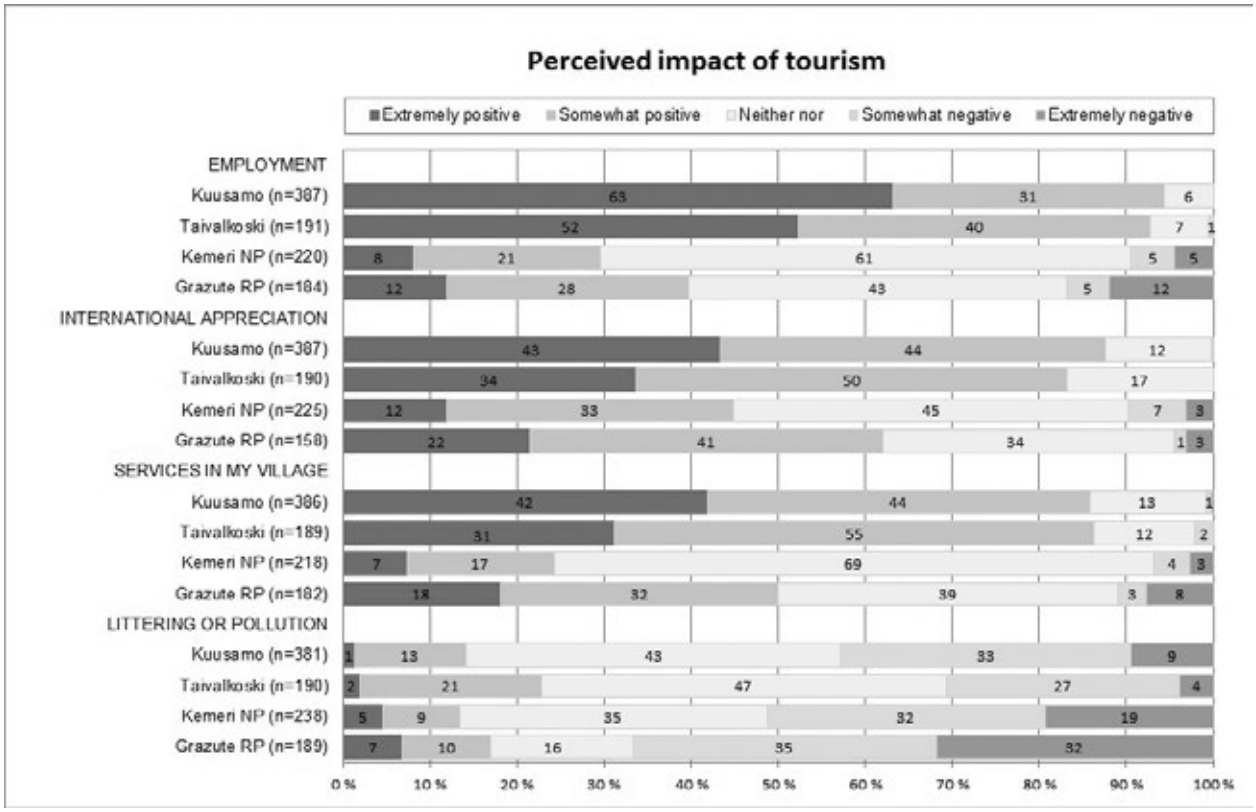

Figure 1. Impacts of tourism reported by the local communities of Koillismaa region (Kuusamo, Taivalkoski), Kemeri National Park and Grazute Regional Park.

The results reflect that due to the tourism history in Koillismaa region, there is relatively strong involvement of local communities in tourism on economic and political level, especially in Kuusamo. Overall in Finland, the importance of producing key statistical figures of tourism has been realized several decades ago. This has catalysed research and communication on economic influence of tourism in Koillismaa region, enhancing recognition of tourism as an important livelihood. Similarly, Metsähallitus Natural Heritage Services has actively monitored visitation on protected areas and has communicated resulting impacts of visitor spending on regional economies. Thus, a careful conclusion can be drawn that in Koillismaa region there is relatively good recognition of tourism impacts compared to the Kemeri and Grazute study areas. Furthermore, the results underline the significance of quality impact monitoring and efforts on communications and discussions with the local communities. This study revealed regional differences in how the impact of tourism is perceived. Therefore it gives valuable information where the focus of future development actions should be positioned in each protected area. However, differences in the characteristics of the study areas between Finland and Baltics are important to keep in mind when observing the outcomes of the study. The findings of the surveys encourage protected area management to further interact with local communities to promote sustainability in nature conservation and tourism development.

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Changes in local community perceptions towards tourism impact. A case from Matsalu National Park, Estonia

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Differently from most other national parks in the world, the Estonian ones (5) have local population living within the boundaries of the national park. This situation has historical reasons, as the parks are designed not only to conserve nature, but also to protect the cultural landscape where the locals have a significant role to play in maintaining these landscapes. In case of tourism development in protected areas local community involvement and benefits are often an important issue. An income from tourism is a possibility to raise locals' satisfaction about national park, at the same time, however, crowds and traffic can cause negative impacts on local community (Andereck, *et al* 2005, Tosun 2006). Matsalu National Park is situated in the western part of Estonia. It was first founded as a nature reserve in 1957 mainly to protect nesting, moulting and migratory birds. The area became a national park in 2004 to protect also the unique landscapes and semi natural habitats as floodplains, reedbeds, coastal meadows, wooded meadows and islets. Matsalu National Park's territory covers 486 km2 and its population is 760. In the current paper the results of two studies are compared. Studies took place in 2006 and 2014 using the same methods and sample with the same main research question: Whether and how the local community can benefit from tourism development in a national park?

Methods

The purpose of compiling the sample was to involve people with community attachment. Sometimes not all the residents identify themselves as community members. There are people who live temporarily in the area or they just live in the area without communicating with other people in the neighbourhood and they are not active to express their opinions. Community attachment is a complex, integrating, multi-faceted concept that incorporates the relationship between people and their communities. Community attachment encompasses several interrelated and mutually defining components and can play a key role in influencing the perceptions and attitudes of residents towards changes or developments in their community (Nicholas, *et al.* 2009, Crowe 2010). The most appropriate method for this purpose was a snowball sampling (Reimann *et al* 2011). In Matsalu, the first list of respondents was compiled following the advice of the park management and it included "local leaders" – village elders, entrepreneurs, land owners, NGO leaders etc. 79 respondents were interviewed in 2006 and 56 in 2014.

Results and discussions

Visitor crowds can be a threat for national park values and also for local communities. 20% of respondents in 2006 and 31% in 2014 expressed that natural and cultural values of the national park have been damaged by tourists. The main problems, which was pointed out, were littering and damaging the information boards in nature trails. Also off-road driving was mentioned. 38% in 2006 and 56% in 2014 were more or less disturbed by the visitors. Residents' proximity to main natural attractions and disturbance matched quite well; those people who lived closer to the main attractions felt more disturbed by visitors. The tourism season in Estonia is relatively short and in the low season some locals even missed to see people around and many of them did not get bored by visitors during the short summer. The main problem was connected to the disturbance of lost tourists who permanently appeared to some residents' homes and asked the way. Better signage and infrastructure will solve this problem. Despite the growing disturbance the majority of respondents were still positively minded of tourists and said that they would like to see more tourists if they behave decently. The majority of respondents said that despite a little growth in tourism and numbers of entrepreneurs there is still a too small number of tourism services and tourists.

In 2014 respondents were not as optimistic of tourism development as they were in 2006. Local's interest in tourism development has decreased from 57% in 2006 to 31% in 2014 (Table 1). Estonia entered into the EU in 2004 which made many new funds available for rural tourism, village movement and local development. As in 2006 tourism was increasing also in Estonia, respondents brought out the lack of finances as the main obstacle.

Table 1. Are the locals interested in developing tourism?

	2006 %	2014 %
Yes	57	31
No	9	13
Cannot say	34	56

By today there have been several projects for supporting local networking and entrepreneurship. But respondents' opinions

were that it was hard to survive with so short season in tourism and the amount of the tourists has not grown as much as expected. In 2014 they pointed out seasonality as their biggest problem. Matsalus main tourism segment is bird watching tourism, but the season in spring and autumn is too short to be economically sustainable. There is a need for some added value and extra services to increase revenues.

When interest in tourism development had decreased, then understanding of tourism as an improver of the life quality of the local community has increased from 73% in 2006 to 90%. Respondents had a clear opinion that tourism improves the life quality, but they were not too sure anymore if it was the best way for local economy and maybe there was some better and more efficient way to improve the life quality.

Conclusions

Local community's enthusiasm in tourism development has decreased between 2006 and 2014. The main obstacle in the development of tourism activities is considered to be the seasonality of tourism and the lack of the coordination between tourism-operators. However, in the opinion of the residents, the development of tourism would significantly improve the quality of their life in Matsalu if it is possible to create some services and activities for the low season.

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Local community perceptions about mountain bike riding in peri-urban national parks

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Introduction

There is growing pressure to allow a greater diversity of recreational activities in some national parks, which often generates controversy (Pickering *et al.*, 2011). Mountain-biking is a good example, as it is increasingly popular - including in many urban and peri-urban parks (Pickering *et al.*, 2011). The appropriateness of mountain biking in some locations is increasingly contested, due to potential social and environmental impacts (Pickering *et al.*, 2011). Perceptions of mountain biking can differ within and among different stakeholders including decision makers, local communities and park visitors (Chavez *et al.*, 1993). A range of studies suggest that conflict can occur among different types of park visitors such as those between hikers and mountain bikers, although this is not always the case (Rossi *et al.*, 2012). However, perceptions of local communities living near national parks, may differ to those of park-visitors, particularly where the potential for conflict results in displacement - with locals avoiding parks (Bentrupperbäumer and Reser, 2008). A survey of local communities living within 5 km of two popular national parks in Australia was conducted to assess residents' perceptions about mountain bike riding, and associated social and environmental impacts.

Methods

Local communities near two national parks (D'Aguilar National Park and Nerang National Park) were surveyed. The parks are proximate to the most populous cities in Queensland, Australia. Both parks feature a network of multiple-use and single purpose trails, which foster a diverse range of recreational activities (e.g. mountain biking, running and hiking).

Local residents' demographic and perceptual data was obtained using a postal survey. Participants were asked to identify how positively, neutrally or negatively they were affected by different recreational activities in the parks, including mountain biking. Also, they were asked to identify social and environmental impacts of these activities. A total of 3,179 households were mailed the survey package, using standard procedures for mail-back surveys (Veal, 2011). The potential benefit of this method is that a large and diverse population can be targeted, but low response rates are typically a limitation (Veal, 2011). To determine differences between locals who were park users and non-users, chi-squared tests were used. To examine the nature of relationships between respondent's characteristics and their perceptions about mountain biking within the parks, Categorical Principal Component Analysis (CATPCA) was employed using the Statistical Package for Social Science (SPSS®, v21).

Results

A total of 270 responses were obtained from the local communities, resulting in a low 8.5% response rate (typical of these surveys). Slightly more males (51%) than females responded to the survey. Nearly all respondents were >45 years old (80%), with only 5% <34 years old. Respondents were well educated, with 59% holding a tertiary or university degree, while 16% of respondents' highest level of education was a vocational or technical education, and just 25% had only completed secondary education. Nearly two thirds of respondents visited their local national park (62%); many of whom are frequent visitors (66%).

Most local residents' perceptions about mountain biking in the parks were neutral, although a few locals had strongly positive or strongly negative perceptions (Figure 1). Perceptions differed between locals who visited the park and those that did not (Chi-squared = 26,719, $p < 0.001$) with proportionally more locals who visited the parks having a positive perception of mountain biking compared to non-visitors (Figure 1). The primary concerns of local national park visitors pertained to safety on the trails; over 20% reported the potential for collisions as a problem. On the other hand, locals who did not visit the national parks were more concerned about environmental impacts. They reported that damage to plants or animals (13%) was their principal concern with mountain biking.

When analyzing the relationship between local residents characteristics and perceptions using CATPCA, park usage patterns did not account for much of the variation in their perceptions of mountain biking impacts, rather it was closely related to respondents' demographic characteristics, including age, gender and level of education. The projection of the variables included in the CATPCA analysis shows visitors and non-visitors in the vertical axes and respondents' perceptions in the horizontal axis (Figure 1). Visitors were characterized by well-educated males between 25-54 years old, while non-visitors were characterized by people very young (<24 years old) or older than 55 years old with lower levels of education

than visitors. Perceptions about mountain-biking were closely related to the reported social and environmental impacts. People negatively affected by mountain biking often reported several social and environmental impacts (Figure 1).

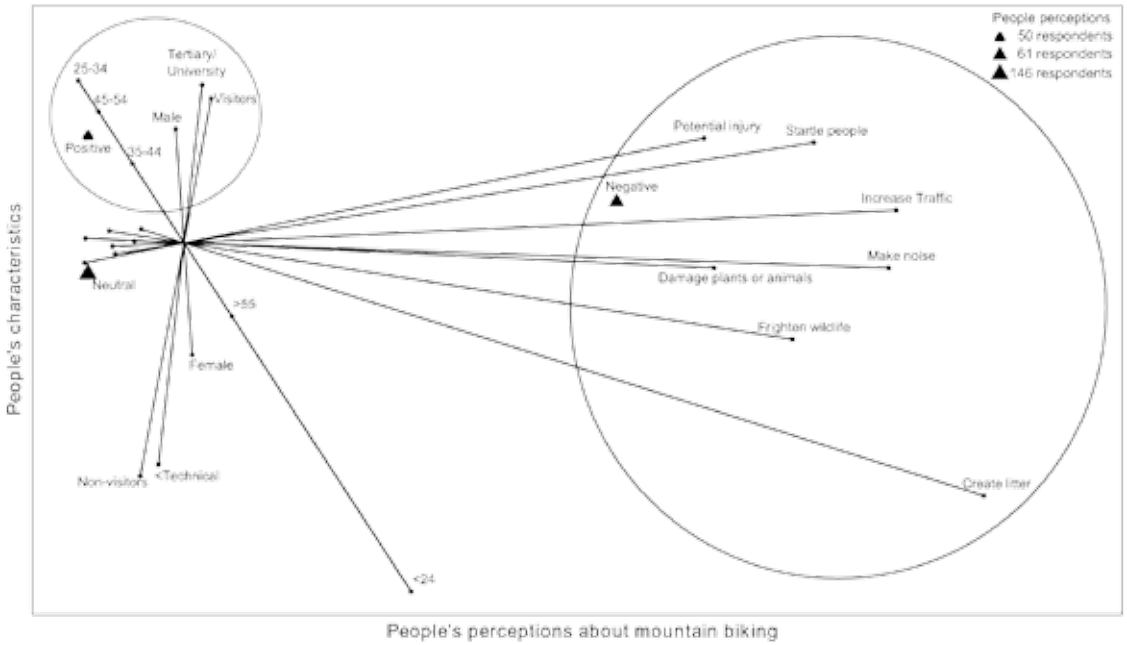

Figure 1. Categorical principal component analysis of local residents' characteristics and perceptions about mountain biking and its social and environmental impacts in two peri-urban national parks in South East Queensland, Australia.

Discussion

Similarly to a previous study which found limited conflict among recreational activities for one of these parks (Rossi *et al.*, 2012), local residents did not report high levels of conflict over mountain biking for either park. However, locals who did not visit the parks tended to have a slightly less positive perception of mountain biking, than locals that did. It appears that locals who do not use the parks may experience social value conflicts, where problems are experienced without direct contact among those engaging in different recreational activities (Vaske *et al.*, 1995). Although the perceptions of social conflicts could be a reason for displacement for these two parks, as has been found in other studies (Arnberger and Brandenburg, 2007) evidence was not found supporting this relationship.

This suggests that displacement due to mountain biking may not be the major reason for some local residents not visiting these parks. Other factors potentially affecting their visitation patterns include age, place of residence and education. These findings corroborate studies that found that residents with higher level of education are more likely to visit a park if it is closer to home (Payne *et al.*, 2005).

Interpreting these findings need to take into account some limitations of the study, potentially driven by the low response rate. This includes an over-representation of people >45 years old, potentially due to a tendency of older members of the community to participate in mail surveys (Veal, 2011), and the greater concentration of older people living close to these parks.

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Community-based ecotourism as a tool for rural development and nature conservation: Lessons from protected areas in Laos

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Abstract

Ecotourism has been regarded as a tool for socioeconomic development and promoting conservation of cultural and natural resources (Goodwin, 2002). The governments of many developing countries including Lao PDR are focusing attention on the development of ecotourism in rural areas, particularly in protected areas in the hope that it will create employment opportunities and raise income for local people (LNTA, 2005). Ecotourism is also expected to contribute financial resources for conservation activities (Gössling, 1999). However, the findings from previous research indicate that local communities receive minimal benefits from tourism. Furthermore, the distribution of the benefits is unequal among tourism stakeholders (He *et al*., 2008). In some cases, ecotourism activities exacerbate environmental degradation in protected areas (Ballantyne & Pickering, 2011).

Our study aims to shed lights on ecotourism as a tool for rural development and the contribution of the sector to safeguard fragile ecosystems by specifically looking at benefit and burden sharing between the various stakeholder groups within and outside the community. The research was conducted in three villages in the Nam Ha National Protected Area (NHNPA), Luang Namtha Province and in two villages, located in the vicinity of the Phou Khao Khouai National Protected Area (PKKNPA), Bolikhamsay Province. The two provinces are located in northern and central Laos respectively.

Ecotourism development in Luang Namtha was based on a top-down approach (Phommavong, 2011), in which the development was initiated by international development agencies. The Lao National Tourism Administration (LNTA) collaborated with the UNESCO Regional Office in Bangkok and funding partners; in October 1999 they launched the Nam Ha Ecotourism Project (NHEP) as the first community-based ecotourism project in Laos. A number of stakeholder groups have been actively involved in the ecotourism development, including the donor organizations, the Luang Namtha Department of Information, Culture and Tourism, NHNPA, and communities at the provincial and village levels. Following the success of NHEP, the model was replicated in Ban Na and Ban Hathkhai, located in the vicinity of the southern part of PKKNPA. Between 2003 and 2004, LNTA was working with foreign development organizations to develop tourism activities in the two villages. The project assisted in setting up a local guide association and a homestay programme in addition to small-scale infrastructure development and technical matters. The tourism activities include village homestay, trekking inside PKKNPA, camping, kayaking, biking etc.

Mixed case study research methods were applied in the study. Qualitative and quantitative data were collected using the techniques such as participant observation, semi-structured interviews, life history interviews, questionnaire surveys, and stakeholder seminars. During the three-year-research period, nine semi-structured expert interviews were conducted with tourism experts from donor organizations, national and provincial tourism authorities and an ecotourism operator. Additionally, 17 semi-structured interviews and 38 life history interviews were conducted with local people at the provincial and village levels. To draw tourist perspective, problem-centered semi-structured interviews were conducted with 52 western tourists, who took part in ecotourism activities in the two NPAs. To gain deeper insights, 228 questionnaire surveys were conducted in the two study areas. Two stakeholder seminars were organized in the two study areas, to receive feedback from the communities to the findings and to develop solutions.

Content analysis was applied to analyse qualitative data, whereas quantitative data were treated applying statistical methods. The preliminary results indicate that ecotourism activities play a significant role in economic development and nature conservation in the two studies areas. In Luang Namtha, the sector creates employment and trading opportunities for local people in the province and NHNPA; however, the benefits are unevenly distributed. Actors at the provincial level (tour operators, provincial tour guides) take a major share of benefits from tourism in comparison to actors from the communities inside NHNPA (local guides, farmers, cooks…). This is explained by better access to education and economic opportunities. At the village level, tourism revenue is merely enough for, according to the respondents, buying "chilies and

salt". Nevertheless, even small economic benefits create significant impacts due to the fact that tourism is one of the few economic opportunities for the communities.

In the second study area, direct economic benefits from tourism are confined only to a small number of families, who work in tourism as local guides, homestay hosts, and providers of transport services.

To spread benefits indirectly to other all community members, "village revolving funds" have been installed at both sites, which receive revenues from tourism. They serve as a microfinance scheme and provide money for community developments such as improving education, healthcare and infrastructure.

As far as tourists are concerned, the biophysical conditions of the areas can satisfy tourists' demand. Nevertheless, service quality requires substantial improvement, particularly English language skills of service personnel who are working in tourism sectors. In addition, the tourists voice concern over the benefits distribution and negative impacts to the local communities.

Apart from contributing financial resources for the NPA management, ecotourism has raised environmental awareness among local people. Several respondents confirm that forest resources have been protected to a certain extent, thanks to the development of ecotourism. Nonetheless illegal activities such as logging, hunting and protected area encroachment are prevalent in the two studied areas.

In both study areas, ecotourism is being acknowledged as a certain additional income source; however, it only generates a marginal income for the local communities within the protected areas. Thus it seems that ecotourism in its current form is not able to compete with other, more environmentally destructive land uses such as logging, slash and burn agriculture, and particularly rubber plantation. Given that economic benefit constitutes an incentive for nature conservation, ecotourism as a tool for nature conservation might be difficult to realize in the long run.

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SESSION 2B ENVIRONMENTAL IMPACTS OF OUTDOOR RECREATION AND TOURISM

Management effectiveness: case study of an Australian remote coastal camping location

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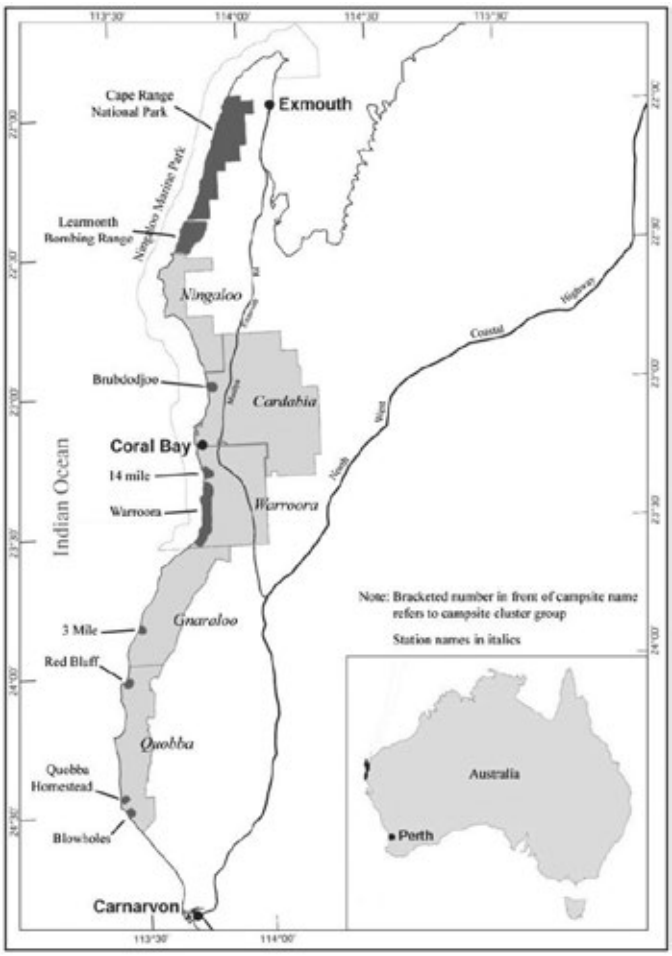
Background

The World Heritage listed Ningaloo coast in Western Australia as a remote camping destination in which gradual environmental degradation is observable at numerous campsites. Campsites within this semi-arid region are all vehicle accessible to varying degrees. Multiple lessees manage land and camp areas along the Ningaloo coast. Globally, research on vehicle-accessible camping sites and their visitors in coastal protected areas is limited while empirical evaluation of management influence is scarce. The lack of baseline and current conditions data has limited management effectiveness, such as setting management priorities and selecting impact management strategies. Few studies on campsites in semi-arid coastal areas exist and include research in Baja (Monz 1998) and on Fraser Island, Queensland (Schlacher and Thompson 2009), of which the latter also contains campsites accessible via four-wheel drive vehicles. Within the international literature, research questions surrounding recreation impacts and management in wilderness areas were examined by Leung and Marion (2000), of which one was: How effective are visitor and site management actions? Research presented in this paper utilised an integrated biophysical-social science methodology in an attempt to answer this question for vehicle-accessible camping sites within a coastal protected area.

Study Area

To be incorporated into the study area, only those management areas deemed remote were considered. Criteria included their location being within or adjacent to the NMP within 200 metres of the beach, with no running fresh water or electricity provided and more than one hour drive from a regional centre. The study area comprises one national park, five pastoral (sheep/cattle) stations, one Federal air weapons range and one local government operated camp area. The Ningaloo Marine Park (NMP) boundary sits 40 metres inland past the mean high tide mark. As such, many coastal camping areas are officially under the jurisdiction of the State's Department of Parks and Wildlife despite being located on land owned or leased by other bodies. The local government operated camp areas have highest level of regulation, enforcing rules surrounding no dogs, no fires and a maximum stay of fourteen days in peak periods. Basic facilities include toilets, roads, paths, control devices and signing. A camp host is present at many of the sites to provide information and keep the site clean. The least regulated camp areas have no regulation and no facilities are provided.



Study area, showing the Nine Camp Areas and their Associated Clusters, Cluster 1 (least regulated) to Cluster 4 (most regulated). Map Adapted from Wood & Hughes (2006)

Method

The methods for this study were adapted from the international literature to suit the semi-arid Ningaloo environment. A quantitative combined survey approach utilising multiple indicator ratings and measures assessed the various environmental impacts at each site. Indices were adapted from the literature to determine the relationship between regulation and both vegetation loss and overall impact of campsites. Indices included the Coastal Vegetation Loss (CVL), Area of Coastal Vegetation Loss (ACVL) and Coastal Campsite Impact Index (CCII), which surmised eight different Indicators comprising: 'campsite area', 'Coastal Vegetation Loss' (CVL, an index), 'barren core area', 'perimeter vegetation damage', 'number of fire pits', 'number of social trails', 'sum of social trail widths', and 'number of litter items'.

In total, 225 initial impact assessments were undertaken. Data collection procedures were adapted to semi-arid, coastal environments comprising both undesignated and designated remote campsites. For analysis, camp areas were grouped into four statistically similar Clusters, categorised by management oversight, facilities, prices, access against which the data are compared. Regulation level through management oversight was also a key differentiator between the Clusters. The null hypothesis was that there is no significant difference between the Clusters with regard to campsite impacts. Factors, which influence magnitude of impact, were analysed through correlation coefficients.

Results

The differences between management Clusters in regard to impact variables and impact indices were measured in order to test the null hypothesis that there is no significant difference between the Clusters with regard to campsite impacts. The findings from the three indices rejected the null hypothesis that no significant differences in environmental impact exist between the Clusters through strong correlations between regulation level and campsite impact. All three indices were found to decrease with an increase in regulation. This supports Smith's (2003) findings from a study in the Eucalypt forests of Western Australia's south-west which found that designated campsites experienced significantly fewer adverse impacts than did the informal ones. However, that despite these general correlations, all Clusters contained variables on which they scored well and on which they could improve. For example, the lesser-regulated sites had challenges with campsite spread, whereas the higher regulated areas had challenges with litter. Whilst visitation levels varied at each Cluster, some

management practices were shown to be more effective than others. For example, one camp area handed out large rubbish bags with check-in and collected rubbish daily which resulted in very little litter. There were no Clusters that exhibited no adverse environmental impacts.

Factors found to reduce magnitude of impact included management presence, campsite containment, campsite boundaries and vegetation type, whilst the provision and extent of rubbish bins were found to not necessarily reduce the presence of litter. Reducing campsite area spread and the presence of livestock should be areas of management focus in the less regulated locations. Indirect management presence through volunteer camp hosts also reduced social impacts such as litter.

Additional impacts viewed offsite, which may affect campsite impacts, include prevalent use of four-wheel drive vehicles, which damages surrounding vegetation. By understanding each Cluster's specific characteristics and vulnerabilities, adverse environmental impacts may be ameliorated through equally specific management initiatives. Individual campsite impacts should also be considered.

Conclusion

The research provides valuable baseline data and management recommendations on this topic for the vulnerable and World Heritage listed Ningaloo coast. The relationships identified between management variables and impact and use variables contribute significantly to conceptual understanding in recreation ecology and recreation sciences. This research also addresses a major research questions for vehicle-accessed remote campsites within a coastal, semi-arid environment.

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Environmental impact of forest recreation in Estonia – results of ten years of research

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Introduction

Forest recreation has gained in popularity in recent decades and is becoming one of the most important activities of the multifunctional use of forests. It is controversial that the greatest danger to forest recreation is its increasing popularity, since overuse may change environmental conditions.

For the State Forest Management Centre (SFMC / RMK), the manager of state forests in Estonia, one of the objectives of nature management is to offer recreational possibilities in the wild and introduce sites of protection value through the nature tourism system based on everyman's right in recreational and protected areas.

Recreation management

In order to guarantee the recreational use of state forests in sustainable ways, the SFMC has applied a system of 13 recreational areas around the country with numerous nature trails, campsites, forest cabins and huts. In addition to its recreation areas, since 2009 SFMC is also engaged in visitor management in the five Estonian national parks and nearly 40 other protected areas.

In order to manage the recreational areas in sustainable ways an integrated monitoring system has been established and used since 2002:

- the interests and needs of users and changes in needs are periodically monitored (visitor survey);
- the number and distribution of visits are assessed (visitor counting) and
- the environmental impact of recreational activities is systematically (once in 4-5 year period) observed by:

1) regular monitoring (done by SFMC) and
2) periodic research (during last year's done by Estonian University of Life Sciences upon request by SFMC).

Environmental impact evaluation

Research for measuring the environmental impact of recreational activities on problematic and critical areas with higher recreational load was launched in 2002. The need for a regular monitoring method to observe the environmental condition of all recreational sites became evident and a condition class based monitoring of environmental impacts for almost all campsites started in 2008. A monitoring method for nature trails has yet to be established.

Regular monitoring

With a regularly implemented monitoring for every environmental criterion a rating of 1 to 5 is assigned based on visual observations and the condition of soil and undergrowth is measured. Based on the ratings, indexes are calculated, which give a good overview of environmental condition and may indicate a requirement for higher management attention and to include the site to periodic research.

Periodic research

In research a system of ecological indicators, characterising changes in ecosystems - condition of soil and undergrowth, area of bare mineral ground and ground vegetation cover, plant species composition and distribution, condition class of the trees and natural regeneration has been worked out and tested.

Different methods are used on:

1) campsites and
2) nature trails.

A permanent monitoring network has been established: this enables the condition of the areas, the changes occurring in them and the effectiveness of the protective measures taken to be measured and assessed.

In the process certain limits of acceptable change (LAC) (Stankey *et al*. 1985) have been worked out and implemented. The scope of environmental changes is regularly observed in order to prevent exceedance of LAC by using measures of visitor

management and landscape protection in recreational areas.

Environmental impacts and landscape protection measures

The main forms of environmental impact by forest recreation in Estonia are as follows:

1) biota (fauna) is disturbed in their habitats;
2) damage to trunks and branches of trees and bushes, and deterioration of forest health;
3) damage to and trampling of natural tree regeneration, decreased natural regeneration capacity of forests or the emergence of unfavourable distribution patterns of tree species;
4) littering;
5) unauthorised trails and bonfire sites;
6) wildfires;
7) damage to ground vegetation, mosses and lichens;
8) soil compaction, water and wind erosion; and
9) exposed and damaged roots.

Based on research the main problem with tree condition in campsites is the small amount and unsatisfactory condition of young trees and natural regeneration, which may hinder the sustainable development of forests at campsites. In about half of the areas studied, the share of young pine trees and natural forest regeneration amounted to less than 10% of all trees.

The share of healthy older trees account for around half of all trees studied (abiotic, biotic and anthropogenic damages are valued), but only about one-fifth of all damaged trees have been directly damaged by visitors.

In campsites the main problems remain soil damage and erosion, especially in places where it is possible to drive by car into the forest. The issue is especially significant for coastal areas, where soil damage and erosion as well as damage to natural tree regeneration through trampling and driving are common. However, with different visitor management decisions implemented, the overall condition is in general improving: a positive trend in the soil and undergrowth condition has been achieved (Table 1).

The condition index (Almik *et al*. 2008) provides a good overview of soil and undergrowth conditions on campsites: the lower the index, the better the condition of the area (possible value from 1 to 6). For Estonian forest ecosystems the index value up to 3.3 is considered acceptable.

Table 1 Study results of soil and undergrowth condition index depending on different management decisions made.

Campsite	**Condition index**		**Index variation**	**Main landscape protection measures used**
Research years	**2003**	**2007**		
Kauksi	3.11	2.81	-0.3	Area reorganized; vehicle access limited.
Raadna	3.69	2.94	-0.75	Closed for 4 years, area reorganized.
Peraküla	3.63	3.64	0.01	(Site on sand dune.) Wooden pathways.
Krapi	3.05	3.33	0.29	Visitor guidance; vehicle access not limited.
Lemme	3.58	3.35	-0.22	Vehicle access limited.
Research years	**2005**	**2010**		
Valgjärve	3.20	2.55	-0.65	Parking limited on road next to site.
Mustjärve	3.34	2.84	-0.49	Vehicle access limited.
Kaljupealse	4.0	2.2	-1.8	Area reorganized.
Research years	**2006**	**2012**		
Tõrvanina	3.4	2.7	-0.7	Area reorganized.
Mägipä	3.6	2.9	-0.7	Area reorganized.

Conclusions

The integrated monitoring systems and research provide a combined result available for planning and management and enabling the manager to work out the best solutions for conditions where there are increasing numbers of visitors.

The best overall results on soil and undergrowth conditions have been observed in areas with organised in-area planning, establishment of a proper network of roads and parking areas, limited vehicle access to the forest, and proper visitor guidance.

In conclusion, it can be said that while the prevention of the negative environmental impact of forest recreation requires a lot of effort, a number of positive results have been achieved despite a significant increase in the visit popularity of

recreational areas.

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Codes of conduct: managing interactions between visitors and wildlife in natural areas

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Sandra Magdalena Granquist, Institute of Freshwater Fisheries and the Icelandic Seal Center, Sweden

Wildlife tourism in Iceland

Visitors to Iceland come in search of unique nature-based experiences. Known as a land of geysers, volcanoes and glaciers, Iceland is also home to interesting species of wildlife that add significantly to the attraction of the country. In 2013 tourism for the first time became the largest export sector in Iceland, taking over from fisheries and aluminum (Oladottir 2014). In the same year, an Icelandic Tourist Board report (Oladottir 2013) predicted the country would receive one million visitors during 2020. Popular media, however, frequently claim that this number may be reached in 2014. This rapid increase in visitation is coupled with concerns about sustainability of the industry and its products, and how the associated issues and challenges should be managed successfully.

It is well documented that tourism can negatively impact wild animals (e.g., Green and Giese 2004); nevertheless, the phenomenal growth in wildlife tourism in Iceland has developed without comprehensive policies or guidelines. Managing tourism to ensure positive visitor experiences, while also minimising disturbance to wildlife, is a field of on-going interest. Codes of conduct, designed as guidelines to govern tourist activities in wildlife habitat, are often developed in reaction to a particular local situation rather than as a result of long term strategic planning. Compared to government based regulations and legislations, more informal codes can be relatively quick to implement. The introduction of a code of conduct can have positive effects on wildlife (e.g. Wray *et al*. 2010). However, codes of conduct seldom eradicate negative impacts on wild animals (Quiros 2007; Duprey *et al*. 2008) partly because important factors that should be considered when preparing such codes are rarely elaborated.

Codes of conduct and ethical principles

In May 2014 The Wild North project released a series of codes of conduct designed to guide visitor interactions with whales, seals, birds and foxes across several Nordic countries, including Iceland. This paper examines these codes, through a case study of seal watching on the Vatnsnes peninsula in northern Iceland. The region supports a large population of harbour seals (Phoca vitulina), which haul out on skerries close to land, where they are readily observed by visitors to the region either on foot or by organized boat trips. This paper discusses the identified need for The Wild North codes of conduct, their history and anticipated implementation on the Vatnsnes peninsula. Based on a literature review and secondary data, we compare The Wild North codes with those used in other countries to gauge their strengths and weaknesses. Questioning the efficacy of codes of conduct, we ask: Are there better ways to manage wildlife tourism?

Searching for better ways, a set of ethical principles designed to facilitate a more ecocentric approach to managing the interactions between visitors and wildlife in natural areas is explored (Burns, Moore and Macbeth 2011). The principles encourage visitors to recognise the intrinsic value of wildlife and develop a sense of moral obligation and moral reasoning toward their wildlife experience. The principles propose that management strategies work within a precautionary framework, acknowledge the interconnectedness between people and nature, and accept that wildlife belongs in nature. This requires managers to engage in a reflexive process with regard to their own ethical position to facilitate the practical application of an ecocentric approach.

Understanding and effectively utilizing codes of conduct

The study revealed that codes of conduct are commonly developed and used as an idealized way to guide tourism related interactions with wildlife. However, little attention appears to have been given to assessing their effectiveness. Consequently, we argue the need for greater attention to monitoring and evaluating the effectiveness of codes of conduct. Based on the ethical principles, we also suggest that codes of conduct with a more anthropocentric focus support the perception of wildlife as tourism objects; that is, for their use to people (an extrinsic, or instrumental value) which may not be the most sustainable way forward. In contrast, codes developed by those concerned primarily with protection of the animals tend toward discourse that may alienate the visitors and not encourage compliance behaviours.

Arguing that an interdisciplinary approach, incorporating expertise from both biologists and tourism specialists, is needed to research, develop and monitor codes (Granquist and Nilsson 2013), we propose how codes of conduct might look if they start from a perspective that promotes the intrinsic value of wildlife to visitors. Applying ecocentric ethical principles to codes of conduct enables us to translate current thinking in wildlife tourism to real world applications. Our goal is a framework for the development of codes of conduct that maximise the positive experience for visitors to natural areas and

minimize their disturbance of the wildlife.

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Risk assessment of antifouling emissions in sensitive marine environments - semi closed port, marina or an anchoring area

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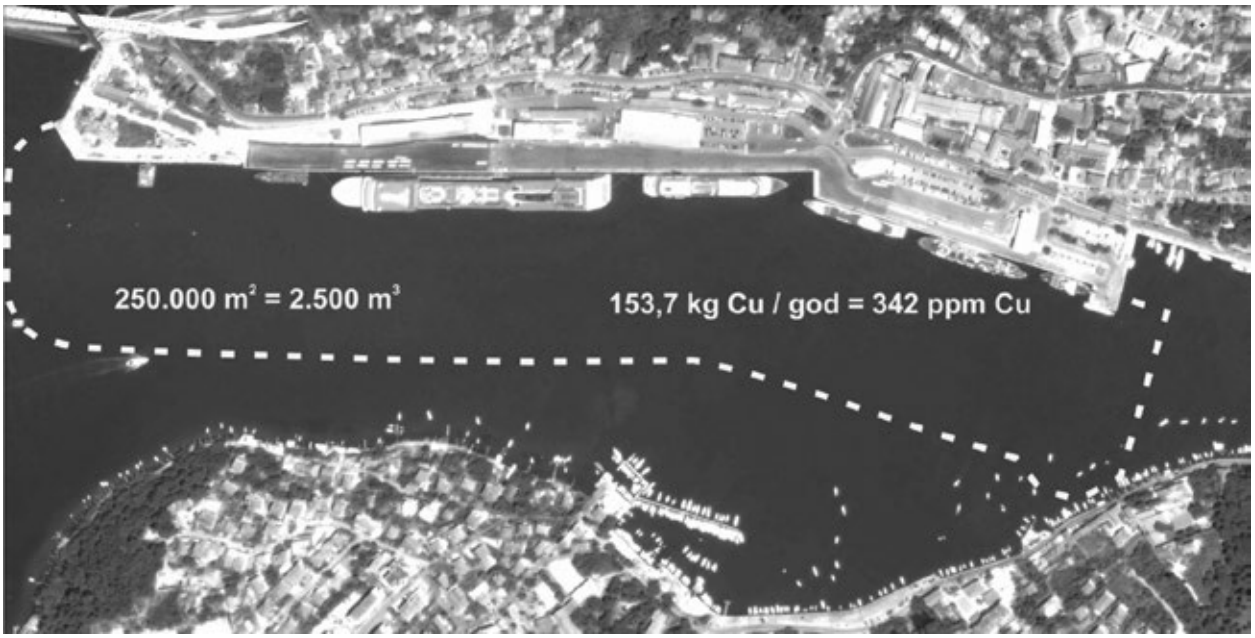
Introduction

Growth of tourism in marine environments is constantly increasing environmental contamination risks, frequently neglected by various management practices. Paradoxically, environmental degradation ultimately decreases the quality of resources tourism is dependent upon. Antifouling-related contamination from Vessels is one of the most serious threats posed upon marine ecosystems.

Methodological approach

We propose here an interdisciplinary triangulation to evaluate antifouling-pollution environmental risks within the frame of the Dubrovnik Port case study. Heavy metal environmental burden was calculated based on the ships data (submerged ship area and heavy metal emission rate). Pollution risk was detected and was confirmed by three independent ecotoxicological studies conducted independently in the same area: (1) heavy metals sediment analyses, (2) antifouling related imposex occurrence in banded murex Hexaplex trunculus and (3) biomonitoring study on Mediterranean mussel Mytilus galloprovincialis.



Map: The hypothetical intervention area at the Dubrovnik Port marine area, with the basic parameters for the calculation of copper contamination of sediment (Map source: Google Earth)
Description: The surface area marked on the map is ~250,000 m2, annual amount of biocide Cu deposit is 153,7 kg, and the volume of the sediment is calculated by multiplying this area with the 1 cm/year sedimentation rate, leading to total volume of ~ 2,500 m3 of contaminated sediment.

Findings

Presented calculations pointed out that economic benefit of pollution prevention for the port in question can rise up to substantial saving of 1,8 mil € / year. Results of ecotoxicological studies undertaken in this area corroborate the contamination level appraised in these calculations. Chemical analyses of contaminants in the sediment and biological data derived from the past studies on Mediterranean mussel and banded murex provide alarming evidence that Dubrovnik Port can be considered as one of the Adriatic pollution hot spots.

Based on the above it can be concluded that presented calculation of Cu emissions can be calculated based on data on boat traffic that is usually available with port or environmental management authorities. This calculation can serve as an

indication of potential antifouling risk for ports, marinas, or anchoring areas of any sensitive or marine protected area with vessel activity. If this indication shows an outstanding value, such as described in the Dubrovnik port case, any of ecotoxicological monitoring methods can be applied to directly monitor and evaluate the pollution impact.

Expected result - implementation

Work presented here offers new and simple methodological approach to assess antifouling environmental risk by combining the calculations of antifouling emission and pollution cost using data available to any port authorities with the simple ecotoxicological endpoints that serve as readily-available indication of environmental threat.

Implementation of methodological approach presented here in the future risk assessment studies will further promote development of Good Environmental Status Descriptors in accordance with the Marine Strategy Framework Directive. Environmental improvements can and should be achieved through the wider implementation of alternative antifouling technologies that are currently in use or being researched.

Summary

1) Tourism practices generally ignore environmental impacts and can ultimately decrease the quality of environmental resources that tourism is dependent upon.
2) Marine sensitive areas are especially neglected when it comes to the issue of antifouling emissions in tourism / recreational vessels.
3) A calculation of ecotoxicological burden based on boat traffic can serve as an indication of contamination risks.
4) Antifouling Risk Assessment can be confirmed through the biomonitoring methods.
5) Environmental improvements can be introduced through substitution of antifouling coating.
6) Environmental management of sensitive and protected areas should incorporate this type of monitoring and risk assessments.

SESSION 2C PROMOTION OF OUTDOOR ENVIRONMENTAL EDUCATION AND LIFESTYLE

Children's use of nearby nature in Norway: no longer an integrated part of everyday life

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International studies show that children nowadays use neighboring nature areas for play to a lesser extent than before (Valentine 2004, Gill 2008). Despite good access to nature areas and despite nature and outdoor life being deeply interwoven in the national identity, this is also perceived to be true in Norway (Skar & Krogh 2009). In Norway we observe a growing concern about children's decreasing contact with nature, but little quantitative knowledge exists about the extent, and eventually change, of children's relationship with nature. An on-going study about meaning-making in children's nature contact today therefore includes a national survey among 3160 parents about where, who and when children between 6 and 12 years stay in nature areas (Skar *et al*. 2014). The survey is to be supplied with qualitative case-studies, which among others issues focus on play in nature in different contexts presenting higher or lesser degree of adult presence. The study is led by NINA (Norwegian institute for nature research), but is a collaboration between Queen Maude University College, Telemark University College and Centre for Rural Research. This presentation will show main findings from the national survey, conducted in January 2013.

Findings from the survey show that, even though access to nature areas is rated as good, children play in neighboring nature areas much more sporadically than in other, more arranged areas such as parks, gardens, street yards, quiet streets and playgrounds (Skar et. al 2014). The garden is the most commonly used area, and trampoline jumping the most common activity. 53 % of Norwegian children never or seldom play in forest areas, and this is the least frequent activity among nine being asked about in the survey.

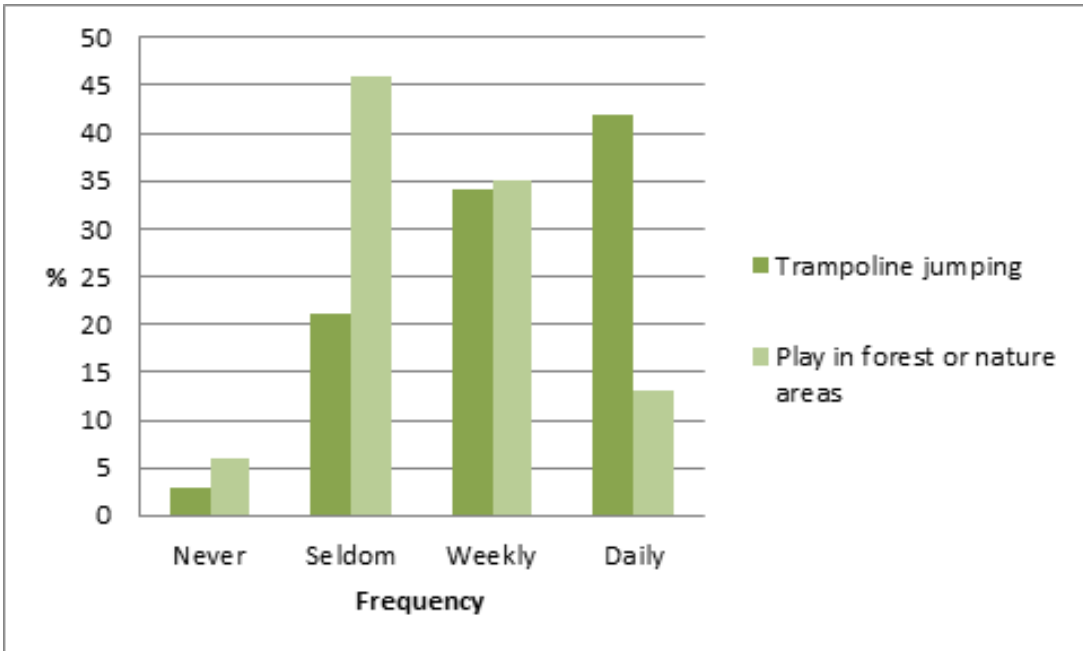

Figure 1. Children's participation in the two activities *Trampoline jumping* and *play in forest or nature areas* compared (seldom=maximum 2 times per month.)

According to parents, important hindrances for children's use of nature areas are primarily related to time pressure. The reason being the amount of (organized) leisure activities and homework, or simply that one tends to prioritize other activities. However, the survey also reveals that traffic situation comprise an important hindrance. Children with parents considering the traffic situation as *good* or *very good*, use both nature areas and the neighboring areas in general, more often. Children in this group also participate more often in the other activities enquired, than those of parents considering the

traffic situation as poor. The exception is use of parks and playgrounds, and this demonstrates that arranged play areas are even more important when the traffic situation is poor.

A common concern nowadays is that children to a lesser extent than before are to be seen outdoors without adults being present. The survey shows that in summer, 70 % of children are on a daily or weekly basis, outdoors alone without "parents really knowing what they are doing". As such 30 % of children are rarely outside without adult presence during summer. Thus, children's own initiated activity/play is still important, even though the extent is seen to be sporadic for many. When it comes to play in nature areas specifically, more children seem to use such areas *with* adults present, than without.

Further, it is interesting that the 6-9 year olds play and dwell in nature areas more than the 10-12 year olds do. This youngest group also attend walks/hikes in "forest and field" most frequently. The fact that the youngest age group spend more time in nature than the older and more independent children, emphasize that the extent of children's nature contact nowadays is highly dependent upon parents' effort.

Children's use of neighbouring nature areas should be seen as an integrated part of their everyday life. Knowledge about participation in other activities, socio-demographic status and other factors is therefore included in the survey. An important present day factor is the organization of children's leisure time. The survey shows that children regularly attending organized activities outdoors also use their neighbouring areas more. In addition, this group is the one that walks by foot or uses bike to school and other leisure time activities most frequently. A pattern seen in the material is that the ones not participating in organized leisure time activities (19 %) also are the ones using neighbouring areas, and especially neighbouring nature areas, least. These correlations indicate that children's definite and bodily experiences from being active in organized settings constitute a basis and increase the motivation for also being active in the neighbouring areas. At the same time the survey shows that participation in organized activities is related to social factors, and especially to parents' level of education.

While nature area near children's home earlier was an important informal meeting place for children across age, gender and social status, this survey shows that nature contact today has become something the adults in much greater degree eventually *choose* for their children, but in strong competition with attractive indoor activities, other organized activities and in a pressed time schedule. Children are naturally the next generation of outdoor recreation participants. Understanding how, when, who and why children do not experience nature, is important knowledge to provide opportunities for future outdoor recreation. Such knowledge can be used to provide better social and physical framework conditions for outdoor life among children, in line with health- and outdoor life political objectives. In a context where children's nature contact has had a transition into being less informal, spontaneous and self-initiated, parents, educators and teachers have gotten a more important role as motivators and managers - in addition to practitioners in area management.

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Promotion of outdoor environmental education based on the monitoring of local environment in Sabah, Malaysia

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Background

Activities in the first two years

So far, we have started monitoring surveys on wildlife, water quality and the growth of the planted trees. At least 11 species of mammals and various birds have been recorded in the photos and videos from automatic camera trap. Water samples are taken regularly from the river, ponds, runoff from households as well as sewage from palm oil mills; the parameters include dissolved oxygen, chemical oxygen demand, ammonium ion and clarity. Three forest plots have been set up for monitoring the height and diameter change on all the trees in each plot.

At the same time, environmental education (EE) programs have been implemented in Batu Puteh village several times, to familiarize local children with nature around them. A training course on EE design were provided to eight staff members of a major role in EE. In November 2013, three delegates from KOPEL Bhd. visited Japan for three weeks to be exposed to various forms of environmental education. We have also been trying composting kitchen waste, and making soap out of used cooking oil.

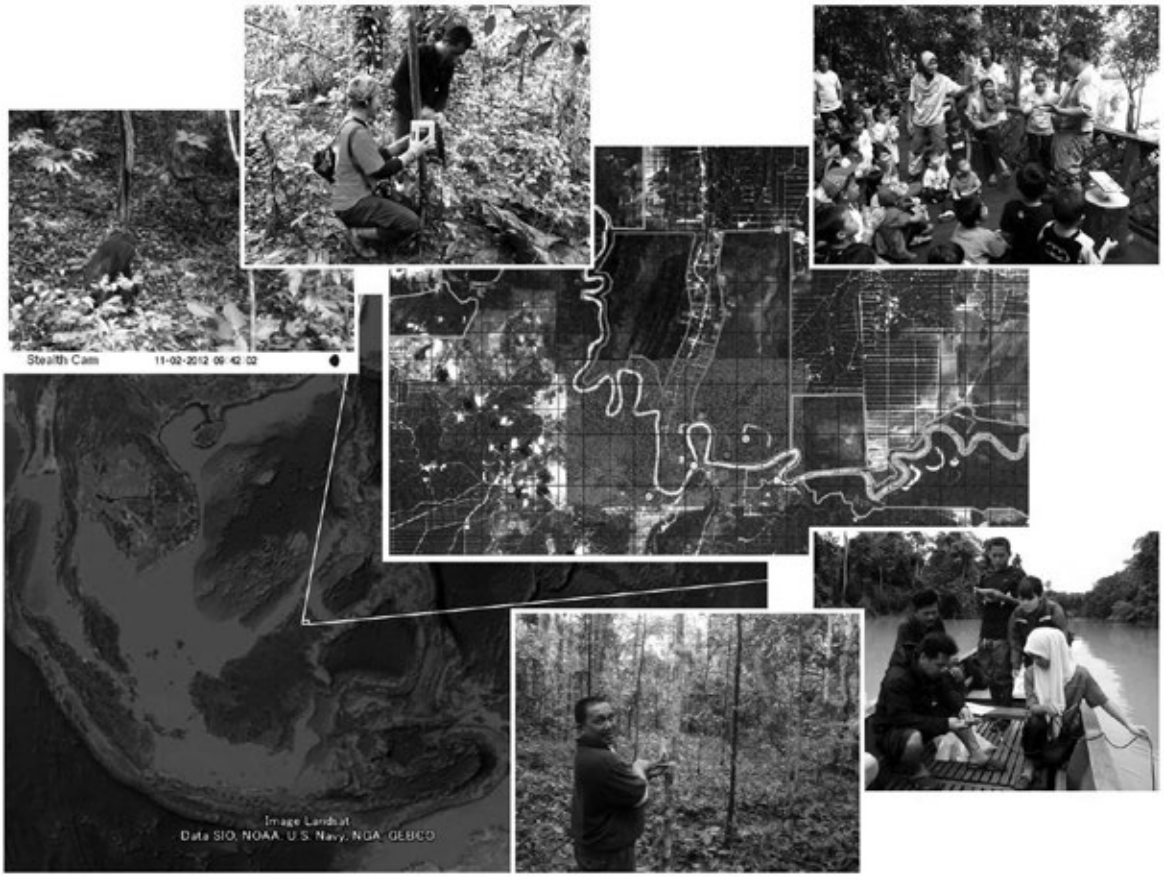

Fig. 1 Monitoring and environmental education activities in Batu Puteh village, Sabah, Malaysia

Environmental education in Sabah, Malaysia

Initiative by the local government

The National Policy on the Environment (2002) emphasise the importance of education in protecting their natural resources and ensuring sustainable development of Malaysia. The Sabah Environmental Education Policy (2009) set out by the Ministry of Tourism, Culture and Environment Sabah, clearly states that the government agencies, NGOs and

educational institutions should actively be involved in and/or implement environmental education. Collaboration among these organisations is encouraged through Sabah Environmental Education Network (SEEN).

The most popular place for environmental education in Sabah is Rainforest Discovery Centre (RDC) under the Sabah Forestry Department. They provide education programs for the local children and student groups from across Sabah, schoolteachers, as well as tourists from overseas. Their programs put special emphasis on tropical rainforest and bird watching. By providing training courses for schoolteachers, they also aim to spread environmental education to schools and other educational institutions in Sabah.

Environmental education at schools

The schools and teachers, however, have little experience yet in practicing environmental education. It is difficult and time-consuming for the teachers to improvise classes about nature and environment, and effectively raise the students' awareness. In the yearly outdoor camping programs, which KOPEL Bhd. accepts occasionally, schools tend to give conventional programs such as athletics or cooking.

It would be easier and quicker if we could provide a ready-made environmental education package to schools. Rather than competing with RDC, we have started to lean on and collaborate with RDC. Eventually we will add diversity in environmental education offered in Sabah, by focusing on different aspect of the environment, such as wildlife and water quality. Schools will have more options to choose from, thus students should have chances to go through environmental education.

Another initiative for environmental education comes from our donor: JICA. Apart from being our donor agency, they have been operating the Project on Sustainable Development for Biodiversity and Ecosystems Conservation in Sabah (SDBEC) and its preceding project for more than 10 years. One of their activities, called River Environmental Education Programme (REEP), targets school children to educate them the importance of water catchment and its conservation. As JICA works closely with the state government of Sabah, we have channel to various sectors of the government. In 2014, we are planning to organize a training workshop on biodiversity conservation together with JICA, Natural Resource Office (NRO) and Sabah Wildlife Department.

Implications of our project

Impact on the community

Our next step is to create an effective visual aid. We are now making an online, map-oriented database on which KOPEL staff should display their monitoring outcomes. A visual map can help them share their findings, and understand the current situation in their own locality. It will also become a powerful tool for EE programs, as well as for planning conservation activities. By making it open to the public, the map itself can attract tourists. 'Map with stories' as such has a high potential in multiple aspects.

KOPEL Bhd. is now under transition from a pure tourism attraction to an education and information centre. If visitors to Batu Puteh village increase, the extra income would raise awareness in the community on the importance of the surrounding environment and its conservation. It can lead to the sense of pride and attachment to their own community. In turn, the people would be more motivated to conserve the nature; hence the positive loop appears.

Challenges and opportunities

The largest concern we are facing is the funding. At the moment, schools seem reluctant to allocate their budget to environmental education. We might appeal more to the government agencies and private sectors to invest for the better future of Sabah. Our mission is not only to sustain KOPEL Bhd.; it is to create a flow of money from the society to environmental education.

This project can be an example of transition from pure tourism to educational tourism. Wherever the place may be, the primary concern would be funding. We can try different patterns of collaboration with local agencies, and share the experience with similar initiatives in the world.

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Mountaineering marathon on Fruška Gora – the promotion of active lifestyle

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Introduction

Fruška Gora is an isolated, narrow, island mountain in the Pannonia plain, in the north of Serbia. The main characteristic of this region is the existence of numerous protected, rare and endangered species. In addition, it is rich in cultural heritage, namely 17 orthodox monasteries famous for their specific architecture, treasuries, libraries and frescoes and numerous archaeological sites from prehistoric and historic times. Fruška Gora is proclaimed a National Park in 1960 in order to provide its permanent protection and to improve its natural resources and beauty. The area of active protection is 25.525 ha. Due to its outstanding natural resources that bring its visitors closer to nature, Fruška Gora is an ideal place for rest and recreation (National Park Fruška Gora, 2014). Globally, most protected areas, and especially national parks are the focus of substantial, and in many cases, increasing recreational and tourism interest (Newsome, 2014). Fruška Gora has created conditions for a one-day stay in the woods, therefore, its intangible values, such as beautiful landscapes and opportunities to experience nature and recreate, are the most important motives for the visit. For the past 37 years, the mountaineering club "Železničar" has been organizing a two-day mountaineering marathon on Fruška Gora with the aim of promoting its cultural and natural beauties, improving healthy lifestyle and raising ecological awareness.

Mountaineering Marathon

"A special day I live for" (Female, 28, Hungary). This is how an international Marathon attendee described this manifestation held annually on Fruška Gora for the past 37 years, either at the end of April or at the beginning of May. It has both competitive and recreational character and gathers participants from different European countries. It has 17 trails in total out of which 97% run through the wilderness and only 3% run though the urban environment. The trails are projected so as to pass through the most idyllic parts of Fruška Gora and by several monasteries, frequently changing the elevation. The routes are customized for recreation and for athletes, with length ranging from 4,3 km (Trail of Joy) to 111 km (Ultra Marathon Plus).

Method

The aim of this study was to generate insight into the scale and extent of such organized event in one geographic area and determine the participants' profiles and motives for taking part in the Marathon, which by all means has the multiple positive impacts – ecological, health, social etc. In addition, the authors sought to get participants' assessments of different aspects of the event organization. As the main research techniques, the on-site survey and in-depth interview were conducted. The questionnaire was distributed among the Marathon participants in 2013, while the organizers were interviewed and their existing statistical database was analysed. Non-parametric statistical procedures, Chi-square test ($\chi 2$ - test) and Analysis of Variance (ANOVA), were applied in order to obtain the results.

Results and discussion

According to the statistical data, in the recent years, the number of marathon participants has increased. In 1978 their number was 407 and over the years it has increased significantly, reaching 18.727 participants in 2013 (Table 1). The growing popularity of the event and the large group of people interested in visiting and recreating in natural areas constitutes a complex demographic of users and indicates the people's need to reconnect with nature. In this preliminary study, most of the respondents reported that they participate in the Marathon in order to have fun and socialize (45%) and spend time in the natural environment (30%). However, only 7% of them reported that they participate in the Marathon in order to compete, while 18% claimed that their main motive for participation is hiking. On the other hand, their assessment of specific organizational aspects of the manifestation was not very satisfying. This leaves space for the improvement of the transportation to/from Fruška Gora, and certain trail facilities; garbage bins and toilettes in particular.

Table 1 Fruška Gora Mountaineering Marathon overview

	The First Marathon	The hardest Marathon	The Marathon with the least number of participants	The Marathon with the largest number of participants
Dates	27-28th May 1978	24-25th May 1980	8-9th May 1999	27-28th April 2013
Trail number and length	1 trail - 86 km	1 trail - 87 km	1 trail - 81,3 km	17 trails of different length
Number of participants at the start line	407	947	11	18.728
Number of participants at the finish line	306 (75,18 %)	409 (43,19 %)	11	16.835 (89,9 %)
Number of participants that gave up	101 (24,82 %)	538 (56,81 %)	0	1.892 (10,1 %)

Concluding remarks

It is evident that the natural recreation has gained the increasing societal importance in the last decades. The growing number of participants in the Marathon, which is estimated to range from 14.000 to 20.000 in the recent years, accounts for the important fact to support this statement. The main idea of the Marathon is to promote healthy lifestyle and attract more visitors into the nature. Therefore, it is to be hoped that there will be an exponential growth in the number of natural recreationists the whole year round. The management of, and issues associated with, recreation and tourism in protected areas encompasses a diverse and complex array of actual and predicted impacts, planning frameworks and management strategies. The park managers and the Marathon organizers should take responsibility of educating participants and supervising the event, thus the ecological and recreation policy should be carried out.

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Promotion of health and wellbeing through nature in project Moved by Nature.

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Background

Increasing prevalence of a sedentary lifestyle, physical inactivity, obesity, and mental health problems present a major challenge for modern society. These lifestyle changes associated with an alarming epidemic of Type 2 diabetes are causing enormous health care expenses to the society. In addition, these factors are significantly lowering the quality of life at an individual level. Research shows, that environment significantly modifies lifestyle factors.

Extensive literature suggests that natural areas and urban green space provide multiple benefits on human health and wellbeing (Hartig *et al.* 2014). These benefits are partly associated with increased physical activity and the health outcomes received from physical activity in general. However, green exercise appears to be more beneficial to mental health over indoor activities (Barton & Pretty 2010). Contact with nature has restorative effects on people, which help us cope and recover from physical and mental stress (Tyrväinen *et al.*2014). Preliminary evidence exists on physiological outcomes (e.g. positive effect on heart rate, blood pressure) associated with natural environment. Furthermore, nature has beneficial effects on social interaction, and on the sense of belongingness, as well as on psychological determinants such as mood and perceived health (Keniger *et al.* 2013). Increasing knowledge of health benefits of contact with nature has yielded efforts to connect professionals within park and health sector worldwide. However, so far nature has been underutilized as a health promotion context in Finland.

Metsähallitus Natural Heritage Services (NHS) manages Finnish national parks and other state-owned protected areas. In 2010, NHS launched Healthy Parks, Healthy People Finland programme that aims to improve public health by activating people to get out into natural settings, enjoying genuine nature experiences, and improving their physical health through a wide range of outdoor activities. It also aims to promote collaboration between park and health sectors. A Moved by Nature-project was launched as an implementation project of the Healthy Parks Healthy People Finland programme in Eastern Finland in April 2013. The aim of the project is to increase the use of natural areas and urban green space in health promotion by developing services in public, private, and third sector that improve the access to nature among different population groups.

Project design and implementation

Primary target groups of the project include practitioners in private and public sectors, as well as voluntary workers in the third sector. Included sectors cover park, health and social sectors, educational sector, as well as nature tourism. Development work is based on building new networks between these sectors, increasing knowledge and skills, and facilitating the product development based on physical activity and outdoor recreation in natural areas. The project also provides education for all sectors on the health benefits of having contact with nature. Mass media is extensively utilized to promote participation in nature-based physical activities. In addition, project prompts general discussion on the role of nature in human health and wellbeing and on the concern about the consequences of the loss of nature contact in urbanized societies.

To develop health and wellbeing services, several pilot studies are being conducted in the project (Table 1). These pilots are especially targeted to four target groups including individuals at risk of type 2 diabetes, and individuals at risk of exclusion; i) immigrants, ii) unemployed, and iii) youth with low education. Practical activities conducted with pilot groups in nature will serve as a learning tool for the professionals in different sectors, and also as an opportunity to collect data on participants' and organizers' experiences of the nature activities and their impact on participants' wellbeing. Groups will participate in health enhancing physical activities in four nature destinations in Eastern Finland. As an outcome of the pilot studies, services and models grounded for the natural environment and physical activity will be developed for the promotion of health and wellbeing.

Table 1. Summary of the Moved by Nature project's main actions to integrate nature into promotion of health and wellbeing

Aims		Host partners of Metsähallitus	Primary target groups	Secondary target groups	Intervention/actions
I	To develop nature-based models to promote youth health and to prevent exclusion from school.	Metsäkartano Youth and Wilderness Centre, Savo Consortium for Education, Rautavaara municipality	Social and youth workers, teachers, instructors, professional hiking guides	Young people in general, and at risk of health problems and social exclusion	3 field trips with youth at risk (n≈12). 3 field trips with 4 student classes (n≈80).
II	To integrate nature into social integration and health promotion of immigrants.	City of Lieksa: - Immigrant services	Health and social workers, volunteers, professional hiking guides	Immigrants	3 field trips with Somali mothers and children (n≈15). 3 field trips with young Somali men (n≈8).
III	To integrate nature into employment activities and health promotion of unemployed people.	City of Lieksa: - Social services	Health and social workers, professional hiking guides.	Unemployed	6 field trips with long-term unemployed men and women (n≈8).
IV	To develop models to motivate lifestyle change through nature-based activities.	Rehabilitation and wellness centre Kunnonpaikka	Health promotion professionals - Nurses - Physicians -Instructors (PA & diet)	Working aged-people at risk of metabolic syndrome and Type 2 diabetes	6 field trips with men with elevated waist circumference (n=20).
V	To integrate health benefits of nature into higher education curriculum.	Savonia university of applied sciences Karelia university of applied sciences	Teachers and students at the university of applied sciences (health studies)	Families, older people, obese and inactive people, rehabilitation clients etc.	Lectures and practical lessons (e.g. organizing nature activities at dementia home).
VI	To improve the access to nature by developing facilities and services	City of Kuopio, and city of Lieksa	Managers of the nature conservation and recreation areas	Citizens of all ages, entrepreneurs, sport clubs	Multi-sectorial workshops

Project is due to January 2015 with a total budget of 335 000 €. The project is managed by Metsähallitus, Natural Heritage Services in Southern Finland. The main funders of the project are the European Social Fund and the Centre for Economic Development, Transport and the Environment. Project is co-operated with Savo Consortium of Education and several public, private and third sector organizations.

Preliminary results

To promote health through outdoor recreation, there is an evident need for sharing the expertise between practitioners in nature and health and wellbeing sectors. In general, there is currently vast insufficiency in skills and knowledge related to health benefits of interacting with nature, as well as practical skills to combine nature and health promotion. Pilot studies, as well as media interest towards the actions of the project have indicated so far that there is a large interest towards providing more opportunities for people to promote their health and wellbeing by having stronger contact with nature. However, including nature in health promotion practices requires multi-sectorial co-operation.

Conclusion

Nature provides an important environment for the promotion of health and wellbeing. However, there is an evident need for enhanced co-operation and education to strengthen the role of natural environment and outdoor recreation in the prevention of physical, mental, and social health problems. The Moved by Nature-project will provide new models to promote health and wellbeing through physical activity in nature.

We acknowledge European Union Social Fund, Centre for Economic Development, Transport and the Environment, City of Lieksa, Municipality of Rautavaara, Savo Consortium of Education, Huoltoliitto ry/Spa Hotel Kunnonpaikka, and Metsäkartano Youth and Wilderness Centre for funding the project.

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SESSION 2D RISK AND SAFETY IN OUTDOOR RECREATION

Stop or go? An analysis of avalanche risk assessment behaviour of skiers

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Introduction

Winter sport activities such as ski touring off the slopes are very popular. Besides the positive effects of these activities for athletes and winter tourism, there are hundreds of avalanche accidents and up to one hundred avalanche deaths in alpine areas every year. Most of the avalanche victims triggered their avalanche themselves. Although there exists always a residual risk for avalanches, many of these accidents could have been avoided by assessing the risk correctly. Thus, one of the most important questions is why so many skiers have obviously misinterpreted the signs of high avalanche risks. Unfortunately, little knowledge exists, how skiers decide whether they can use a slope for a descent or not.

Research questions

This study examined the decision-making process of how out of bound skiers and snowboarders, ski touring and snowshoe hikers, decide to use an unmanaged backcountry mountain slope for a descent or not. The following research questions guided this study:

- How many and which risk indicators skiers take into account when they decide to descend or not in avalanche endangered area?
- Which risk indicators play a major role in their decision making?
- Do interactions between the "avalanche danger rating" and other factors influence skiers' decisions?

Method

An online visual conjoint-choice experiment coupled with 3d computer animations investigated the influence of several avalanche risk indicators on skiers' decision-making behaviour. This approach presented 256 3d-modelled mountain scenarios, which were described by eleven attributes (Figure 1). Each scenario consisted of a computer animated 3d film which showed a snow-covered slope and pictograms which presented additional risk indicators. The factors included those avalanche risk indicators, which are used by most of the risk management concepts.

Three main factor categories were explored: a) environmental factors: for example, avalanche danger ratings, slope gradients, slope directions, and weather conditions; b) social factors such as group size and other skiers descending the slope; and c) trip planning related factors such as time effort needed for a save alternative route. The survey in German asked participants' intentions whether they would go downhill or not for 16 scenarios.

Data of 1466 participants from Austria, Germany, Switzerland and Italy were collected during the winter seasons of 2011 and 2012. The survey also asked socio-demographics, skiing experiences and recreation specialization in these winter activities. This research was supported by the Austrian Federal Ministry for Economics, Family and Youth, the Austrian Kuratorium für Alpine Sicherheit and the Austrian Association of Alpine Clubs (VAVÖ).

Figure 1. Examples of computer animated backcountry mountain slopes, which included eleven attributes

Results

Results indicated that all included factors and several interactions between these played a role in skiers' decision making. The avalanche danger rating had the strongest impact on their decisions, followed by slope steepness and snow type. Although all investigated factors played a significant role in the decision-making process, the major impact on decision-making was overwhelmingly based on two factors only. Respondents interpreted risk indicators mostly in the right way; however, missing information on risk factors was interpreted as a medium risk. For example, most respondents interpreted an unknown avalanche danger rating as a medium danger rating. Such an interpretation behaviour can be fatal.

Group effects could be observed. If there were already skiing traces in the snow cover or other skiers on the slope, most participants evaluated such conditions as safer as those without these uses. This safety perception can be delusive.

Study results are useful for the improvement of existing avalanche risk management concepts and decision support aids.

Alpine-wide quality standards for nature-based tourism

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Introduction

The alpine-wide dimension of tourism collaboration has a long tradition; be it on a destination level, in politics or in research. Since 1991 the Alpine Convention serves as a guideline for the promotion of sustainable development in the alpine regions. The presented research for an alpine-wide nature-based tourism is to be seen within this tradition (Alpine Convention 2013).

Nature-based tourism in the Alps can be regarded as a form of sustainable tourism. Its definition comprises of a responsible stay in natural areas and cultural landscapes, which are close to nature. Nature-based tourism encompasses the whole spectrum of the tourism service chain from mobility, accommodation and gastronomy, activities to information and marketing. (Seco 2002; Baumgartner 2003; Lundberg, Fredman 2011).

Despite the fact that in some alpine countries suitable initiatives have been taken, no alpine-wide quality standards for nature-based tourism exist. However such standards would benefit alpine destinations, especially the tourism service providers and partners. In this context the paper focuses on the following research questions:

- Which quality standards and criteria can be applied for the development of nature-based tourism in the Alps?
- How can nature-based tourism be integrated in the management of alpine destinations?

Methods

The first step of the research consisted of a literature analysis to clarify the definition, delimitation and characteristics of nature-based tourism and of ten guideline-based expert interviews with actors of nature-based tourism. This resulted in a draft of quality standards for nature-based tourism in the Alps. As the second step a quantitative alpine-wide online-survey on nature-based tourism with actors in tourism and other relevant stakeholders was carried out. Thereby the draft of quality standards was further specified. The validation of quality standards was carried out with an expert workshop and with the application in six case studies in the Alpine Region (holiday regions Engadin Scuol and Val Müstair, Switzerland; national park Gran Paradiso, Italy; nature park region Lechtal-Reutte, Austria; regional nature park Massif des Bauges, France; Solčavsko region, Slovenia and the outdoor provider Faszinatour, Germany).

Results

Nature-based tourism is of great significance in alpine destinations. Until now nature-based tourism in the Alps has only been practiced by individual service providers (e.g. tour operators), but has not been exploited by the destination itself. Nevertheless high quality nature-based tourism can only prevail if it receives adequate significance within the destination management. Thus, nature-based tourism is to be included in the destination strategy. (Bieger 2004;; Lundberg, Fredman 2011).

The results of the expert interviews and the online survey show, that there is a rise in demand for nature-based tourism offers by an increased number of visitors, e.g. scenic hiking trails, attractive mountainbike trails and guided field trips. However, these offers are often not provided in the alpine destinations.

Standards are common in quality management of the service economy and in environmental management (Ulrich, Waxenberger 2002). Quality standards of nature-based tourism constitute a normative basis for the management of destinations. They guide the management on how nature-based tourism in destinations can be shaped, further developed and which requirements should be fulfilled. Figure 1 illustrates how quality standards should be considered in all phases of the management circle of a destination. Each of the ten quality standards (QS) comprises five quality criteria (QC).

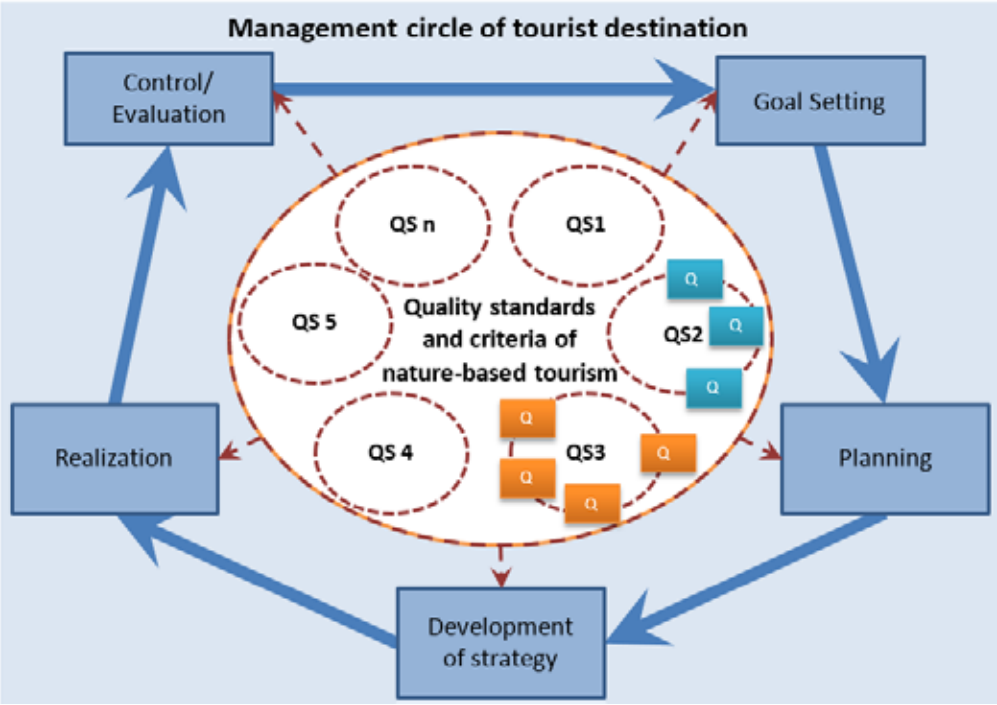

Figure 1: Quality standards (QS) of nature-based tourism and its criteria (QC) in the management circle of a destination. (Source: own design).

Ten quality standards for nature-based tourism can be differentiated as nature-based destination; pleasant quality of the place with reference to architecture, landscape and space; nature-based development of offers; adapted accomodation and gastronomy; nature-based activities; fostering of slow mobility; protection and enhancement of nature and landscape; information & sensitization; nature-based marketing; promotion of regional added value; quality management, evaluation and research.

Conclusion

Applicable quality standards need a definition of nature-based tourism. In addition, it is important to adjust the deduced quality standards with relevant actors by means of participatory methods. For that matter it is important to analyze which actor groups play the vital role within this process and how quality standards can explicitly be integrated in the management systems of a destination. The set of quality standards compiled within this project can become a useful and practical instrument for stakeholders in alpine destinations to support and promote the further development of nature-based tourism. This can on the one hand result in additional added value and on the other hand nature and landscape values can be preserved.

Acknowledgements

The authors wish to kindly thank the Bristol Foundation for providing funding for the project 'NaTourCert'. In addition, we would like to thank the numerous stakeholders and experts who supported us with their expertise within the project.

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Monitoring recreational qualities and impacts in coastal and marine areas

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Introduction

Each year, thousands of people visit marine protected areas (MPA) around the world. Coastal and marine areas are popular because of their unique natural qualities and recreational opportunities, often resulting in close encounters and experiences with nature. Just like any terrestrial protected area (TPA), however, MPAs often face a challenge when it comes to balancing environmental and recreational interests. A central focus is thus on how to best plan and manage goals for nature conservation alongside an increasing level of recreational and touristic activities. (Pike, *et al*., 2010). This puts great emphasis on management efforts, including visitor and environmental monitoring. But is it possible to do monitoring in water-dominated areas, where people enter the area from all directions without any means of control or observation? And where visitor impacts are quickly washed away or disappear in the endless depths? This paper will address this managerial challenge.

Background

As human activity poses an increasing challenge in MPAs in the form of visitor impacts on the environment, there is a growing need to monitor visitor activities and behaviour in order to counter impacts on the environment (Stelzenmüller, 2013). For a long time now, MPAs have thus received increased attention within the natural and social sciences with a focus on how to keep goals for nature conservation and protection alongside offering quality recreational experiences to visitors (Fish, *et al*., 2005). This is of course a managerial challenge in all protected areas, but even more so in MPAs, where impacts on the coastal and marine environment often are hidden beneath the surface and where recreational activities are spread out in a large area. Consequently, MPA managers need to build a fundamental understanding of the environmental and recreational profile of their area, if recreational opportunities are to be kept intact and visitor impacts minimized (Cole, 2004). This emphasises the need for effective monitoring methods that can supply managers with such information.

Aim and scope

A monitoring method combining both environmental and recreational interests is one such management approach. With this method at hand, managers can direct their actions to areas of attention and make qualified decisions that benefit both conservation goals and recreational opportunities. However, while combined monitoring efforts are found in a few studies from terrestrial areas (e.g. Alessa, *et al*., 2008; Lyon, *et al*., 2011), studies from coastal and marine areas are basically non-existent. This is a problem, especially since management and monitoring of terrestrial areas differs from marine based areas due to different landscape contexts and conditions, effecting both the application and results of different management and monitoring approaches. Consequently, managers of MPAs need new professionalised and combined monitoring methods, rooted within both the natural- and social sciences, and with a distinct marine focus, in order to attain successful management. In order to remedy this situation, the primary aim in an upcoming paper is thus to introduce the development of a combined, interdisciplinary monitoring method, focusing on both environmental and recreational monitoring efforts, and designed especially for coastal and marine areas.

Methods

Two parallel studies performed in Kosterhavet National Park, Sweden, during the summer of 2013 will form the base of the data presented and discussed in the paper. One study was conducted by a marine ecologist looking at visitor impacts on soft and shallow sea floors. Filming the sea floor using a custom-made underwater sled with an attached camera, several transects in the form of inventory studies were made from chosen areas in the national park, and subsequently analysed for human impacts. The other study was conducted by a human geographer mapping and describing the recreational profile of the study area, including visitor related activities and conflicts. Three monitoring methods were employed: on site observations (n=37), short on site interviews (n=101) and a small two page questionnaire survey (n=513) that also included a mapping exercise of visitor activities. In the end, the two monitoring activities were combined and put into GIS layers in order to pin point and compare popular visitor locations and high impact areas.

The presentation

The presentation will delve into this work in detail by first describing the context and importance of recreational and environmental monitoring studies in coastal and marine areas before introducing the combined monitoring method itself. This will eventually lead to a presentation of the results of the two studies as well as a discussion and some reflections on the usefulness and limits of the monitoring approach, with a special focus on practical implications for area managers.

Last, the general interdisciplinary nature of the method will finish off the article alongside thoughts about future research opportunities.
Based on this approach, the paper is explorative, descriptive and evaluative in its form. Furthermore, the intention is that the paper is of interest to protected area managers as well as environmental researchers and scholars with an interest in natural resource management.

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Winter data collection in Canada's mountain parks

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For three consecutive years, winter backcountry use data was collected at sites in Banff, Glacier, Kootenay and Yoho national parks. Research focused on levels of use and user demographics, motivations, and degrees of preparedness and experience. Back-country (off-piste) skiing and snowboarding, cross-country skiing and ice climbing figured in the study.

Background

Located along the Rocky and Selkirk mountain ranges in western Canada, the research sites comprise four of the seven national parks that are collectively known as Canada's mountain national parks. The Parks Canada Agency is responsible for national park management.

In 2009, knowledge on levels of backcountry winter use and the people who are 'out there' was identified by Parks Canada managers as a gap in the information they needed to effectively meet Agency goals for protection, visitor experience and education. Queries were linked to the allocation of resources for track setting, safety concerns, ski trail expansions, out-of-bounds skiing and conflicts between user activities (i.e. skiing and snowshoeing).

Methods and Limitations

To gather information on levels of use, TRAFx infrared counters were installed at up to 55 selected sites. Data was collected each year between October and April with variable dates between sites. The following research limitations arose when using this methodology: a) routes change over the season due to snow fall levels, avalanche hazard etc.; if the new route does not pass in front of the IR counter, use is not recorded, b) occasionally counters malfunctioned due to moisture in the unit and temperature, c) counters recorded humans *and* wildlife, d) snow buried the infrared scopes, and e) counters provided a level of use but could not differentiate the 'type' of use, for this one needs to employ cameras. Simple remedies included the use of lithium batteries, calibrating the counters with cameras and repositioning scopes after heavy snowfalls. Parks staff conducting winter field work are required to attain a minimum AST 1 to access "simple" terrain where infrared counters were placed, in tandem with MRG winter orientation training. Training schedules occasionally caused the postponement of fieldwork.

Demographic, motivation and experience-based data was collected using surveys and semi-structured interviews. Attempts to conduct trail head surveys on cold and 'bad weather' days proved fruitless; 'good weather' days were somewhat fruitful though informants were usually keen to get on the trail and reluctant to stand around while being surveyed. Fortunately, surveying was more productive at avalanche awareness nights, onsite promo events and, especially, at the Rogers Pass Visitor Center where winter trail users are required to register before entering the backcountry. Data collected was analysed using SPSS, Microsoft Excel software and inductive content analysis. Reports were presented to managers at the end of each winter season.

Rogers Pass

Winter research in Glacier National Park was of particular interest since this area receives over ten meters of snowfall annually. Situated in the Selkirk Range in British Columbia, Rogers Pass, in Glacier National Park is known around the world as an unrivalled ski touring and ski mountaineering destination. The terrain in Rogers Pass is steep, serious and complex. All ski destinations in the park require knowledge of travel in avalanche terrain, and skiers are urged to wear avalanche transceivers and be prepared for self-rescue. There are over 250 avalanche start zones, resulting in over 130 avalanche paths, which threaten the roughly 40 kilometres of the Trans-Canada Highway that transects Glacier National Park from east to west. Avalanche control is practiced though-out the winter in order to keep the highway open to traffic for as many days as possible. A Winter Permit System reduces backcountry users' risk by restricting entry to specific areas when scheduled avalanche control is underway. Permits are obtained at the Rogers Pass Discovery Center. Individuals entering a Winter Prohibited Area or a Winter Restricted Area that is closed to entry, or not complying with permit conditions, may be prosecuted, resulting in a maximum fine of $5000 and/or permit cancellation (Parks Canada 2014).

Our three years of data confirmed that levels of use were increasing – rather dramatically in some areas. The multi-year levels of use were charted against weather and snow-fall data to assess potential correlations.

During winter 2010/2011 John Cattie, a graduate student from Lakehead University, joined the study. Based in Rogers Pass, he conducted 377 surveys and 20+ interviews. His work revealed that the great majority (89 per cent) of backcountry skiers/snowboarders consider themselves to have intermediate or advanced skills in their chosen winter sport. Very few (8 per cent) had less than one years experience and many (37 per cent) had more than 10 years experience. Eighty (80)

per cent said they were in the backcountry more than 10 days per winter. Avalanche conditions, weather and terrain were the key factors that influenced the choice of a backcountry destination. The most used pre-trip planning tools, in order of preference, were: a) weather forecast, b) avalanche bulletins c) CAA website and d) guide books. Almost all (87 – 80 percent) said they carried beacons, probes, shovels, and extra clothing. Eighty-two (82) per cent of the respondents had some level of avalanche awareness training; 71 percent had attended a course in the last five years (Cattie 2012).

Next Steps

Current data is 'patchy' with some sites being removed from the 3-year study due to Parks Canada budget cut-backs. Research needs to continue in order to establish a solid baseline and conduct trend analysis in the future. 'Emerging' types of use, such as snowshoeing, need to be included in the study. Existing primary source data could be mined for relevant information on user profiles and motivations. Results from this region could be compared with study results from other winter-activity regions. Importantly, universities, the Canadian Avalanche Association and winter tourism agencies should be considered potential research partners.

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Parks Canada (2014) www.pc.gc.ca/eng/pn-np/bc/glacier/activ/activ1.aspx

Operation ironworks: addressing antisocial behaviour in Scotland's first national park

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The close proximity of the Loch Lomond and The Trossachs National Park to Scotland's largest city, Glasgow, and 50% of Scotland's population living within an hour's drive is both a blessing and a challenge for park managers, business operators and park residents. Partly due to the success of national park designation, inadequate infrastructure to accommodate a broad spectrum of visitors and their desires and needs, and increasing incidences of antisocial behaviour of short-term visitors to the park over the past decade required a fresh and heightened management approach. Operation Ironworks was borne from the need to arrest the antisocial behaviour in a number of Park hotspots of a small segment of park users having a disproportionate, negative impact on traditional National Park visitors. This behaviour also adversely impacted residents, land managers and businesses as well as damaged the natural environment, particularly in areas of Special Scientific Interest that attracted the attention of Scottish Natural Heritage. This paper traces the precursors to Operation Ironworks, its evolution, implementation, and outcomes.

Methodology

The methodological approach combines the participant observations of two actors deeply involved in Operation Ironworks, one as a national park manager focusing on visitor and park ranger services, and the second, as a senior police officer tasked with coordinating and strategizing police enforcement services. The third author offers an outsider's perspective having examined the National Park's management strategies and issues for over a decade. In addition to key stakeholder meetings and field observations, a broad range of documents were analysed to assess strategies, effectiveness and efficiency.

Context

The Loch Lomond and The Trossachs National Park is situated twenty kilometres north of Glasgow. The Park itself is adjacent to Scotland's 'Central Belt' that encompasses 3.5 million people and several cities and towns including the capital, Edinburgh. It is estimated that six million people visit the Park every year from all of the world. It is a prime destination for British holidaymakers and is an attractive day or weekend visit location. Until recently a very small percentage of visitors frequented the Park for very different reasons than to experience the Park's natural and cultural assets. As a result, antisocial behaviour became an essential focus of park management and police authorities operating within the Park.

Antisocial Behaviour

Binge drinking excursions to the Park, typically on holiday and fine weather weekends, aided by close proximity, cheap disposable camping equipment, informal camping provisions, and weak public intoxication regulations as well as problematic police response times, over time led to an escalation of antisocial behaviour. Such behaviour seriously deterred bona fide Park visitors, detracted park management from delivering articulated objectives, and routinely tied up policing and ranger resources in the peak season. Vandalism such as chain sawing trees, and the destruction of park furniture, park buildings and private property for fuel was all too common. Unruly behaviour resulting from intoxication was a regular feature in informal campgrounds, and even more perplexing were the intimidation and assault on unsuspecting campers, some of whom were young families. There were knifings in gang skirmishes and even an attempted murder. Damage to personal property such as the torching and total destruction of a camper's car also served to raise concern that something deep-seated needed to be done to avoid having the situation spiral further out of control, causing long lasting damage to the Park and to the social and economic fabric of its residents.

Park Management Strategies

Operation Ironworks is a multifaceted approach to addressing antisocial behaviour within the Park and developing complementary and coordinated management strategies. Spurred on by local communities, the Eastern Shore of Loch Lomond became a key focus of management attention of park managers and law enforcement. Over time Operation Ironworks tasked a police sergeant to address this issue. A Park Police Officer was made responsible for coordinating with park management and particularly park rangers, and in time liaising with all three police authorities having jurisdiction within the Park. There was a move towards more focused patrolling activity, higher profile and more visible presence, and encouraging local residents and visitors to report issues or incidents (see Table 1). Two key bylaws were enacted, one to curb public drinking and intoxication and the second to manage camping to mitigate raucous behaviour, limit environmental damage and improve the visitor experience. The drinking bylaw controlled the unrestricted consumption of alcohol

within public areas and outside tents or caravans while the camping bylaw restricted camping to formal areas or camp sites, removing the opportunity to "wild camp". To reduce inadvertent as well as blatant vandalism, camp grounds were cleaned of vandal impacts, campsites were improved such as providing vandal resistant metal fireplaces, and wood fuel was made more available. Sturdy and aesthetically pleasing barriers were also constructed to restrict vehicle access to beaches, further discouraging unregulated camping. In time campsite environs were improved and refreshed through capital improvements and road congestion was addressed along the shore road by the Stirling Council.

Table 1: Selected Ranger Service Patrols April to September 2012 compared to April to September 2011.

Ranger Team Area	Patrol Route	Number of Patrols 2011	Number of Patrols 2012
East Loch Lomond & Trossachs	East Loch Lomond	208	670
East Loch Lomond & Trossachs	Trossachs 2: Loch Chon	31	64
East Loch Lomond & Trossachs	Trossachs 3: Loch Venachar	45	83
Cowal & Breadalbane	Breadalbane 2: Glen Dochart	19	41
Cowal & Breadalbane	Breadalbane 3: BalQuhidder	23	72
Cowal & Breadalbane	Breadalbane 4: Loch Earn	41	148
Cowal & Breadalbane	Breadalbane 5: Loch Lubnaig	39	104
West Loch Lomond & Water	West Loch Lomond 1	69	93
West Loch Lomond & Water	West Loch Lomond 2	72	91
West Loch Lomond & Water	Luss	72	82

Source: Grant Moir (2012). Ranger Service – End of Season Review 2012. P.6-7.
Loch Lomond & The Trossachs National Park Authority

Results

Operation Ironworks as measured by several important metrics and observations is a resounding success. In the camping bylaw zone for example, pitching tents outside designated areas were down 96.6%, there was a 97.5% decrease in new fire sites, and litter was down 98.4% in 2012 from 2010 benchmarks. As a result of the drinking bylaw, Park Rangers attest to major improvements, statistics show that families are now returning in increasing numbers to the Eastern Shore. Police and Ranger records show dramatically fewer complaints from residents and park visitors, and significantly fewer bookable offences despite increased police presence and greater police and Park coordination.

An interesting question is, where have all the trouble makers gone? An initial concern of Park residents in other areas, as regulations on the Eastern Shore were ratcheted up, was whether antisocial behaviour would simply be displaced to other locations. There is little or no evidence of that. One possible reason, an important element of Operation Ironworks, was to raise public awareness. Incidences, arrests, court proceedings and convictions became part of an important and tightly coordinated media campaign.

Conclusions

Despite its successes, Project Ironworks is a work in progress requiring constant monitoring and vigilance. The lessons learned are now being considered and/or implemented in other Park hotspots and elsewhere. No situation is alike, however, so it is of great interest to see how lessons learned might work in other places.

The social amplification of landowner liability risk in the U.S. Northern Forest

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In the United States, limited liability statutes for recreational use of private lands remove most accident liability from the landowner and place most of the burden of care on the recreational visitor. In spite of these protections, landowners still worry about liability claims and cite accident risk as one of the primary reasons for denying recreational access to their land (Jagnow, Stedman, Luloff, San Julian, Finley, & Steele, 2006). Wright, Kaiser, & Nichols (2002) examined the gap between landowner fears about liability claims and actual recreation-related court cases in the United States, and argued that there was a substantial gap between perception of liability and reality. Bennett & Crowe's analysis of liability in the United Kingdom (2008) noted that "landowner perception of the level of liability risk appears, for some reason, to be overstated" (p. 1). They attribute this perception, in part, to citizen concerns over a "compensation culture" or the rise of a more litigious society. However, little research has specifically examined why some landowners are more fearful of being sued in the event of an accident. Nor has past research examined how these fears translate into specific actions. Does liability fear lead a landowner to restrict all recreational use to their land? Or do limited liability statutes help ease some landowner fears, which then lead only to limited restrictions for recreational access? This paper uses landowner attitudes, perceptions, and knowledge about recreational access and liability to explore why some landowners are more fearful of accident claims, and to explore variation in the types of restrictions that landowners impose on their property.

This study used data collected in 2007 and 2008 on recreational access on private lands in the Northern Forest region of the United States, which includes 10.5 million hectares of forested lands in parts of New York, Vermont, New Hampshire, and Maine. The study included small private landowners with 400 hectares or less (n=1083) sampled from six townships per state (24 townships total). It also included large corporate landowners across the four states (n=88) with holdings that ranged from 300 hectares to over 500,000 hectares.

The analysis used logistic regression and multinomial logit modelling. In the logistic regression model, the dependent variable was a dichotomous variable (Yes/No) that asked respondents to indicate if they were "worried about lawsuits if people are injured on my land." In the multinomial logit model, the dependent variable was a range of eight types of access restrictions that ranged from "allowing people access if they ask first" to "denying a snowmobile or ORV trail right-of-way" to "denying all access to my land." These items were collapsed into three categories that represented a range of less restrictive to most restrictive activities allowed.

The study used eight independent variables in the analysis. To measure the compensation culture hypothesis, we included two indicators. 1) First was a "frivolous claims" type of measure where we asked respondents to report their attitudes about the people who make liability claims – i.e., their willingness to sue and their tendency to blame others for their accidents. 2) Second was an "ambulance chaser" type of measure that asked about respondent attitudes toward lawyers - the cost of legal counsel and their ability to find ways around liability protection. 3) Next, we asked them about their overall familiarity with liability laws in their state. 4) We also asked respondents to report their perceptions about the adequacy of liability statutes in their state. 5) We also included a variable that asked if people thought public access to private land had changed over the previous 10 years. The Northern Forest, like many places, has experienced dramatic land tenure change over the past 25 years. This measure was used as a "culture clash" measure that served as an indicator for local fear of outsider-induced change. Finally, we used three control measures in the analysis. 6) First we controlled for state of residence. Wright *et al*'s (2002) analysis showed that New York had the most number of recreation-related liability cases heard in the courts of any state in the US (81 cases heard during their study interval). At the same time however, New Hampshire and Maine had only ten cases combined, and Vermont had no court cases. So fear of liability may be related to press coverage of accident claims made in the respondents' state of residence. Finally, we controlled for 7) total acreage owned, and 8) corporate vs. private ownership. Large land holdings are frequently owned by corporations or partnerships that have financial or investment interest. Those who own larger tracts of land and have a corporate ownership structure may be more knowledgeable about recreation liability, may be more likely to have liability insurance.

The results showed that only the attitude and perception indicators were related to fear of liability risk. Those who believed recreationists and lawyers are more willing to bring liability claims were more likely to fear lawsuits. Knowledge of the laws, perception that more people were limiting access, state of residence, number of hectares owned, and corporate vs. private

ownership were not significantly related to fear of lawsuits. These results support the notion of a social amplification of risk in the attitudes, beliefs and perceptions about liability risk, which likely work independently of legal reassurances and other situational factors related to location or property characteristics.

The results also showed that there were no differences in the level of restriction to one's property. Those who were more worried about recreationists, lawyers, and lawsuits were no more likely to post their land against all use than those who were less concerned. There were differences in restriction by state and by number of hectares owned, but they did not differ across different levels of restriction.

The results suggest that fear of liability among landowners is not based on legal protection education or the small number of court precedents. Instead fear may be amplified by high profile injury claims in the press from a variety of settings (work, highway, and recreation) and perhaps by the broader socialization of risk through the insurance industry.

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SESSION 3A BEHAVIOURAL AND IDENTITY ASPECTS OF OUTDOOR RECREATION

World Heritage brand awareness and impact: a study of Canadian and US park visitors' knowledge of and behaviour toward the World Heritage brand.

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Introduction

This presentation reports on findings from a study that was designed to investigate visitors' awareness and recall of the World Heritage (WH) brand and the impact of the WH designation on travellers' decision to travel to several protected areas in southern Alberta, Canada. This study contributes to scholarly dialogue relating to global and iconic brands, as well as brands that are managed and communicated by the public sector, namely conservation agencies. Brands managed by the public sector, particularly international brands have received only moderate attention in the communications and marketing literature, and brands relating to conservation have received even less attention. Parks and protected areas are significant tourist attractions. Parks managers' decisions making regarding the development and management of visitation to parks as well as the visitor experience within parks, and the actions that visitors engage in post-visit must be informed by research; this study contributes to evidence-based management of visitors and potential visitors to WH sites.

Background

Rossiter and Percy (1997) argue that brand awareness should be a universal communication objective for any management organization since an individual cannot form an emotional attachment to a brand without it. Brand awareness consists of brand recognition and brand recall (Aaker, 1991; Keller, 1993; Rossiter & Percy, 1997). Brand recognition, according to Keller, is the ability to confirm as having previously seen the brand when given the brand symbol as a cue. Brand awareness is developed by increasing the familiarity of the brand with the visitor (Keller, 1993). Brand recall is the ability to remember the brand when given the brand category or some other type of memory cue (Keller, 1993). In the case of the WH symbol, the meaning of the logo is not inherently apparent. Visitors must be taught what the brand mark means by experiencing it linked prominently, consistently and repeatedly with the WH brand name (King, 2010b, Stolton *et al.*, 2012; King *et al.*, 2012). The brand a protected property possesses has the potential to significantly influence the level of visitation to the property (e.g. Weiler & Siedl, 2004; Morgan, 2006; Reinius & Fredman, 2007; Fredman, Friberg, & Emmelin, 2007; King & Prideaux, 2010).

Based on its brand values, WH represents a 'top brand' (Buckley, 2002) or 'elite brand' based on its prestigious brand values (Hall & Piggin, 2003) and potential value as a national tourism asset (Drost, 1996; Shackley, 1998; Hall & Piggin, 2003; Fyall & Radic, 2006; Timothy & Boyd, 2006; Ryan & Silvanto, 2009; Tisdell, 2010). Today, WH is recognized as an international brand (Buckley, 2002; Hall & Piggin, 2003; Fyall & Radic, 2006; Petr, 2009; Ryan & Silvanto, 2009; 2010; King, 2010a, 2011; Marcotte & Bourdeau, 2012; Dewar *et al*, 2012); however, WH brand recognition appears to vary from country to county (King & Halpenny, 2013; Williams, 2004). This presentation reports data from a study was designed to assess WH brand recognition and awareness amongst Canadian and US park visitors and the role WH designation played in influencing tourists' decision to visit WH sites were data were collected.

Methodology

Visitors to four WH sites located in southern Alberta, Canada were intercepted in July and August 2013; these WH sites were: Waterton Lakes- Glacier International Peace Park, Dinosaur Provincial Park, Head Smashed in Buffalo Jump Provincial Historic Site, and the Canadian Rocky Mountain Parks World Heritage Area (which includes Banff, Jasper, and Yoho National Parks). A sample of $n \geq 200$ per park was collected. These WH sites have other designations (e.g., national parks, provincial historic sites), and all are included within larger regional destination branding efforts (i.e., the Canadian Rockies, the Canadian Badlands, Crown of the Continent, the Cowboy Trail). Data was collected using a survey questionnaire administered on Android tables with pen and paper Survey questions documented respondents' socio-demographic characteristics, length of time spent in park and region, frequency of visitation to park and region, place of residence, motivations for trip, and awareness of heritage values protected by each park. Items and methods from previous studies used to measure how WH designation affects travel decisions were modified for use in a North American

context. These include measures of WH symbol recognition and recall (King & Halpenny, 2013; King 2010), visitor's awareness that site has WH designation (King, 2010; Poria *et al.*, 2010), influence of markers or park labels (Wall Reinius & Fredman, 2007) and existence of WH site collectors (King & Prideaux, 2010).

Next steps

Data are currently begin analyzed using univaritate and multivariate statistical analysis including the use of independent samples T-tests, factor analysis, cluster analysis and regression analysis. Findings will inform provincial, state and regional destination and attraction marketer's efforts to attract interested clients to their tourism offerings. Results will be used to guide these agencies' expenditures of marketing dollars, relating to the development, positioning and promotion of WH areas and related protected area sites.

Modelling service quality, satisfaction and behaviour intention among cultures: the case of cultural and language group in Taiwan

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Introduction

Customer service research in the context of parks and recreation has evolved and matured over the past decades (Manning, 2010). Service quality perception, satisfaction and behaviour intention are one of the most important issues and frequently studied topic in the service industry that included the parks and recreation sector (Zeithaml, Berry, & Parasuraman, 1996). Previous studies found different patterns in parks and recreation both within nation and among cultural groups (e.g., Li *et al*, 2009; Reisinger, 2009; Wang at al., 2014). However, very few studies attempted to model customer service concepts among different cultural groups (Chick, 2009; Jay & Schraml, 2014; Hutchison, 1987, Li *et al*., 2007). The purpose of this study was to examine the differences and relationships of service quality, satisfaction and behavior intention among three main cultural groups in Taiwan including Hoklo, Hakka and Mainlander group. In particular, the role of two language groups, i.e., Hoklo and Hakka language groups, two most recognized regional language groups (the official language in Taiwan is mandarin Chinese) were also explored in this study.

Methods

The data was collected from Taroko National Park, a popular tourist destination on the east coast of Taiwan during 2007 to 2008, as well as Huisun National Forest Recreation Area, a relatively less visited place on the west coast of Taiwan during 2009 to 2011. We intended to collect a sample covered lower and higher population density region around the island. Using purposive sampling procedures, a total of 2179 valid questionnaires were obtained from on-site visitor surveys. In the questionnaire, there were 20 service quality items, which were broken into 4 dimensions, i.e., facility, management, service and information. There were 3 items to measure satisfaction, and 5 items measured behavioral intentions which were broken into 2 dimensions, i.e., recommend and revisit intention. All the dimensions for the three concepts demonstrated acceptable reliability according to their Cronbach's alpha values. The structural equation modeling (SEM) analysis was employed to find causal relationships among service quality, satisfaction and behaviour intention in six structural models including overall, Hoklo, Hakka, Mainlander as well as Hoklo and Hakka language groups.

Results and Discussion

The study findings were described as below: (1) There were significant differences in service quality, satisfaction and behaviour intention among different cultural and language groups. Visitors who were Hakka group, Non-Hoklo language group and Hakka language group tended to have lower service quality perceptions and behaviour intentions. (2) All the six structural models testings revealed good model fits according to a number of goodness of fit indices. In general, the results showed that visitors' service quality and satisfaction significantly and positively influenced behaviour intention. Specifically, service quality significantly and positively influenced on satisfaction in the overall sample, Mainlander group model, as well as Hoklo language and Hakka language group model. Service quality significantly and positively influenced satisfaction, and satisfaction significantly and positively influenced behaviour intention in the overall sample and Hoklo group model, as well as Hoklo language and Hakka language group model. Figure 1. showed the structural model of service quality, satisfaction and behaviour intention using the overall sample. (3) The overall R-square statistics of all models were between 0.38 to 0.59, indicated good practical significance in explaining visitor behaviour intentions from service quality and satisfaction. This study confirmed that there were significantly different relationships among cultural and language groups in Taiwan.

We suggested that managers may tailor their services to meet the needs of their culturally diverse clienteles. The managers may enhance their services on which specific cultural group tended to perceive lower service quality. For example, managers may consider providing more safety information and fairer price in the concession store, particularly for Hakka and non-Hoklo language group, so as to promote their positive words of mouth and revisit intention. Additionally, this study showed significantly positive relationships among service quality, satisfaction and behaviour intention in different cultural and language groups in Taiwan. We are thereby able to demonstrate the cross-cultural customer service relationships in parks and recreation in a non-western context. Finally, we suggest future research further exploring the indicator to indicator (i.e., dimension to dimension) relationships within concept/construct and provide specific management implications for each cultural and language group.

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Guests' reactions to being monitored: the balancing act of added value and privacy concerns

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Purpose

The purpose of this study is to validate theoretical propositions (Anuar & Gretzel 2011) which outline the impact implementing a tourist monitoring project has on guest's privacy concerns. By conducting a qualitative analysis on guest's reactions to a recent tourist monitoring project, the researchers improve the generalizability of and add boundary conditions to the existing propositions.

Background

Over the past year a theme park company in the Central Florida area has begun rolling out a billion dollar project that includes: updated websites and mobile apps, a reimagined ride-reservation system, and wristbands that will serve as all-in-one admission tickets, hotel-room keys and a method of payment. Three years in the making, the company's ambitious "next generation experience" project predates the more recent scandals involving national governments and invasions of privacy that have been ubiquitous in the news. While reputable news services and influential technology websites have been quick to point out the perceived connection between these new services, their tracking capabilities and governmental invasions of privacy, guests and fans have overwhelmingly stood by the company, placing value on the leisure experience over the potential privacy concerns. How has the theme park company managed to rise above the fray involving privacy? How has it managed its relationship with its guests in order to ensure that the message communicated is one of excitement surrounding expanded offerings, not fear over privacy concerns? How do brand strength and guest loyalty play a role? This study seeks to better understand the actions the theme park company has taken involving tourist monitoring, the circumstances surrounding its success, and in doing so providing practical implications for other companies.

Methodology

This study is approached through and grounded by the lenses of an increasingly collaboration driven Web 2.0 world (Goodchild 2007), an increasingly monitored world (Shoval 2007), and the complex relationship that exists between the customer and the organization. This study is supported by a qualitative analysis of public communications between the theme park company and its guests, in addition to communications between third party news sources and their readers. A content analysis of websites is conducted, gathering together communications from the theme park company in addition to news sources presenting material related to the company's actions in regard to tourist monitoring. The content of the communications as well as the responses made by website visitors in the comments section are analysed qualitatively. The thematic analysis consisted of multiple levels of coding, a process grounded in the procedures outlined by Miles and Huberman (1984) and expanded upon by Bruan and Clarke (2006). Individually the researchers first obtained a familiarity with the data, before progressing to free coding, and meaningful theme identification, before finally coming together to collectively agree to a comprehensive list of keywords and overarching themes. The results of the thematic analysis are supported by the details surrounding the implementation of the company's system, including the rollout schedule, and the statistics on guest satisfaction. This study addresses the motivations and opinions of the guests in regard to being monitored, the interaction between the company and the guest being monitored, as well as the opportunities and challenges for other companies.

Practical Implications

The findings of the study reinforce recommendations for companies in the entertainment and theme park industries to implement tourist monitoring efforts into their respective businesses while minimizing guest privacy concerns. Potential positive outcomes include improving the guest experience, improving guest loyalty, and increasing guest engagement and enjoyment during their leisure experiences.

Value

This study represents an empirical test of the future research needs and directions related to privacy concerns outlined by Anuar & Gretzel (2011) in regard to tourism-related location-based services. By exploring the challenges and facilitating factors surrounding the strategic messaging of tourist tracking systems the researchers improve the validity of theoretical propositions related to the relationship between privacy concerns and several antecedents, including: system characteristics, the level of trust, user characteristics, and perceived enjoyment. This study supports the implementation of future empirical studies seeking to validate the qualitative findings and the factors which alleviate guest privacy concerns surrounding the

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Outdoor recreation and place identity in the Kristianstad Vattenrike

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The Kristianstad Vattenrike

The protected landscape of the Biosphere Reserve Kristianstad Vattenrike is a unique landscape construction. Building upon themes in the region's history, an integrated natural and cultural history including an ecologically significant biodiversity, the United Nations Kristianstad Vattenrike Biosphere Area (reserve) was established in 2005. UNESCO (2013) describes biosphere reserves as sites established to promote sustainable development based, in part, upon local community efforts and quality science: "As places that seek to reconcile conservation of biological and cultural diversity and economic and social development through partnerships between people and nature" (n.p.). This effort to present a more relational approach to questions of people and nonhuman nature has been highlighted in the Kristianstad Vattenrike since the designation of the area. The Kristianstad Vattenrike initiative deliberately set the boundaries for the biosphere core area not only inclusive of the ecologically significant wetlands of the region, but also to include the municipality of Kristianstad in this effort to emphasize people as an important part of the natural systems. This integrated approach underscores the value of public engagement in the on-going efforts of the biosphere area. Outdoor recreation will be used as one aspect of the dynamic relationship between people and place to consider landscape identity and sustainable engagement.

Place Identity

An analysis of preliminary visitor survey data collected at the Kristianstad Vattenrike visitor centre, Naturum, has motivated further questions of participation, place identity, and environmental outcomes. For example, the visitor centre visitation data indicated that over 60% of the visitor centre visitors were also using the outdoor visitor sites located throughout the Kristianstad Vattenrike (Beery, 2013); twenty-one visitor sites serve as key locations for public engagement in Kristianstad Vattenrike natural/cultural history topics and outdoor recreation. This documented visitation along with additional preliminary results serves as a springboard for further investigation of the role of outdoor recreation at these visitor sites. Hence this next stage of study explores the outdoor recreation experience more fully and investigates whether these experiences are contributing toward the broad sustainability goals of the biosphere reserve program. Specifically, this study examines whether outdoor recreation shows a relationship with Kristianstad Vattenrike place identity and ultimately with environmentally responsible behaviour drawing on previous work in place attachment and identity (Carrus, Bonaiuto, & Bonnes, 2005; Giuliani, 2003; Scannell & Gifford, 2010; Vaske & Kobrin, 2001; Williams & Roggenbuck, 1989). Environmentally responsible behaviour is explored via a place sensitive approach given both concerns about generic environmental behaviour measures (Beery & Wolf-Watz, unpublished manuscript) and the interest to measure one aspect of public engagement with sustainability on a personal and/or household level. The analysis of particular survey items will also allow for comparisons with Swedish outdoor recreation national survey results from the national project, Friluftsliv i förändring (Fredman, Stenseke, & Sandell, 2014) in an attempt to approach place identity questions from multiple vantage points.

The Role of Outdoor Recreation in Protected Lands Management

In addition to questions exploring place identity and environmental behaviour, the study explores questions of access, participation, barriers, preferences, and environmental connectedness in an attempt to better illuminate the role outdoor recreation is playing in this specific example of protected land management. Data collection includes field surveys of outdoor recreation participants and a survey of a control group of Kristianstad Vattenrike residents. While the current presentation of results will focus on results of the field and control surveys, follow-up interviews from both outdoor recreation and control participants will be conducted as a third stage in this research process. Quantitative and qualitative analysis will explore each group individually as well as provide comparisons of the data sets. A pragmatist methodology underscores the belief in the ability of mixed methods research to illuminate possible insights, outcomes, and new directions for inquiry.

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Revealing sense of place through analysis of interpretive messages in forest settings

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Schama (1995: 61) wrote that "Landscapes are culture before they are nature; constructs of the imagination projected onto wood and water and rock." The cultural and symbolic qualities of landscapes are elaborated in public discourses, including those presented in environmental interpretation, described by Ham (1993: 5) as: "Any communication process designed to reveal meanings and relationships of our natural and cultural heritage to various publics...." Though researchers often study the effects of exposure to interpretive messages on the attitudes and knowledge of visitors to resource places, issues related to the production of messages are equally important.

Written and visual interpretive texts are produced by resource managers and also by tourism and community promoters. Managers and others who provide interpretive information about forested landscapes aim to educate citizens and visitors about natural resources and also to convey the historical importance of forests, raise interest in nature, teach appropriate outdoor behaviour, promote conservation ethics, and stimulate people's senses of place about a place or region and its resources. Collectively, these communications use language, symbolism, and imagery to create imaginative experiences for visitors. Interpretive messages can be seen as strategic, persuasive communication efforts, intended to influence how people think about and value (both symbolically and tangibly) forested landscapes.

The research described here studies how Vermont's forests and forested landscapes are discursively presented in interpretive materials created by outdoor recreation and tourism providers. Because many visitors to forest resource areas access printed interpretive materials on-site or at visitor centres, this analysis focuses specifically on paper-based publications and on-site signage. (Another aspect of the study focuses on internet-based interpretive materials, but these are not addressed in this paper.) The overall goal of the study is to explain the discursive processes associated with presenting interpretive messages that elaborate senses of place in forested landscapes of Vermont.

Background

The concept of *sense of place* has been of increasing interest to recreation and tourism scholars (Kianicka *et al*. 2006; Stokowski 2002). Recent qualitative research studies sense of place as the socially-constructed meanings made visible in interpersonal interaction and public discourse. As Tuan (1991: 694) noted, "Public places…are made and sustained by language…the visibility and viability of places…rests on the quality of human speech." That is, people encounter places in social relationships sustained by conversation – so, a discourse approach to sense of place has theoretical and practical importance in revealing how social actors (resource management agencies, communities, tourism businesses) communicate meaningfully about places.

Methods

We identified public, private and non-profit agencies and organizations involved in forest recreation and tourism in central Vermont. Bisected by major highways, this region also includes notable public lands and tourist destinations such as the Green Mountain National Forest, Marsh-Billings Rockefeller National Historic Park, state and town forests, and private and non-profit land management sites, including ski resorts. In summer and fall 2013, we collected printed interpretive materials (brochures, flyers) and took photographs of texts (signs at exhibits, trails, and museums) at forest recreation sites. Using iterative readings, we evaluated and categorized the texts according to their interpretive qualities: (1) primarily interpretive texts; (2) materials combining informative and interpretive texts; these were further subdivided by their relative emphasis; (3) primarily informational texts; and (4) general publicity materials beyond the scope of the project. Categories (1) and (2) are the focus of this study.

Data analysis began with an initial content analysis of textual materials, followed by qualitative methods (rhetorical, narrative, and semiotic discourse analyses) to study how forests and forested landscapes are discursively portrayed. This involved close readings and assessments of the claims and warrants made in texts, the nature of narratives, and evaluation of symbolic images used in the written materials. Message forms, styles, and themes were compared across agencies and activity settings, as possible, to illustrate discursive differences across management authorities. We are now developing propositions about the form, content, and styles of sense of place discourses presented by resource managers.

Data Analysis

Data analysis is on-going, but preliminary results suggest that only a relatively small proportion of collected paper-based materials can be considered fully "interpretive" according to standards used in the literature of environmental interpretation. Many texts are primarily informational, or mix interpretive and informational material. Interpretive texts differed from less interpretive texts in their contents (linking between past/present; using a problem/solution format); in their form (the level of detail presented; whether the text tells a story; the nature of photographs); and in styles used (interpretive texts were more personal). Surprisingly, the forest itself was often given little attention, even in texts where it was central to the stories told.

Conclusions

This research is relevant for public, private and non-profit organizations that support forest education and interpretation programs. Written messages about forests and landscapes are strategic, persuasive communication efforts, and sense of place values in forests are the basis for public and private actions related to forest management, including protection of ecosystem services and long-term planning for forest resiliency. In assessing discursive strategies used by recreation and tourism providers in constructing interpretive texts, the study described here can contribute practical suggestions for improving interpretive messages to help reveal the meanings of place intended by managers for visitors to their resource places.

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Making 'sensible' places: normative considerations in the management of protected areas

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Over the past four decades myriad place concepts has found their way into scientific research and popular discourse for managing outdoor recreation sites and other protected areas. Underlying these various place concepts is a range of normative ideals for prescribing or adjudicating among different conceptions of good or "sensible" place-making. Unfortunately, many who advocate for creating, maintaining, or restoring some particular (normative) sense of place have often justified their views without much recognition of the diversity of positions (both descriptive and normative) associated with the label "sense of place" (e. g., Beatley & Manning 1997). Looking across a wide range of disciplines and discourses, however, one can find at least three major prescriptive (normative, political) ideals for guiding "sensible" place-making. This paper evaluates three sets of norms for guiding protected area management: place as *bios*, place as *ethnos*, and place as *demos* to argue for a more pluralist conception of sensible place-making.

First, place as *bios* builds on the idea that environmental degradation is to an important degree the result of a lost, forgotten, or atrophied sense of place. This line of argument is particularly evident in the philosophy of bioregionalism which asserts that economic, social, and political life can be more sustainably organized around "authentic" natural regions through the cultivation of decentralized, self-sufficient, and self-governing communities (Thayer 2003). Greater alignment between political and ecological boundaries is seen as a way to foster a return to the practice of living-in-place, learning to re-inhabit or become native to a place. Thayer (2003, p. 6) writes that the "recognition of a life-place, or bioregion [means] the acceptance of the need for us all to reassemble the world by integrating the natural dimensions of each of its various regions with a deepening sense that we inhabit a specific place." Rejecting economic globalization, bioregionalism seeks to restore a presumed authentic biocentric (natural) way of acting and dwelling in the world by reestablishing a closer linkage between ecological processes and cultural practices.

Second, building on a communitarian political philosophy, the idea of place as *ethnos* refers to shared ways of life, identities, and parochial attachments (Entrikin 1999). Communitarian social movements seek to strengthen local solidarities and shared histories and identities through commitment to a common set of values, norms, and meanings that define social differences and boundaries between insiders and outsiders. Just as bioregionalism tends to revere the local as a way to enhance ecological sustainability, communitarians defend the virtues of the local on the basis of their presumed thicker ties of tradition and custom as the basis for political unity. Applied to politics, Kemmis (1990, p. 122) has argued for a communitarian style of local governance that depends less on a set of procedures, regulations, and bureaucracies and more on local patterns of relationships and human virtues conceived as "a set of practices, which enables a common inhabiting of a place." As an antidote to the homogenizing tendencies of globalization, communitarians regard human fulfilment and social order as necessitating the kinds of secure attachments and moral frameworks that local communities presumably offer. The normative ideals of both *bios* and *ethnos* stand in stark contrast to the once prevailing view that regarded the local as a site of injustice and emancipatory struggle. Specifically, equating sustainable places to maintaining a local sense of place, bioregion, or community has been heavily criticized for valorising "authentic" nature and local cultures and traditions over more open and egalitarian democratic principles (Entrikin 1999).

Third, in the face of such criticism some geographers have proposed the idea of place as *demos* – characterized as a progressive, cosmopolitan or global sense of place – as the basis for a "political commons" in an increasingly globalized world dominated by plurality and difference. Massey (1993), for example, argues that real places often lack the singular, coherent qualities often attributed to bioregional or communitarian senses of place and instead host plural identities, which are the source of both richness and conflict. This more dynamic, plural, and relational view has the capacity to honour the human need for authenticity and rootedness while recognizing that such sentiment need not become an exclusive enclave. Framed as *demos* good places require an egalitarian ethos built on a cosmopolitan conception of place that is both "rooted in the concreteness of everyday experience and practice" and at the same time open to a world beyond the local and supportive of universal ideals of "a common humanity striving to make the earth into a better home" (Entrikin 1999, p. 280).

Reconciling the different norms used to guide the management of protected areas is not just a matter of identifying place meanings and attachments, it is also a question of the establishing the appropriate social processes and institutional arrangements by which society evaluates and adjudicates among competing senses of a place. From a critical pluralist perspective there is no "correct" set of norms to guide place-making (Williams 2013). As personal ideals or lifestyle models bioregionalism and communitarianism have much to recommend, but as political projects they deliberately empower some stakeholders more than others. The challenge for governing protected areas is how to draw strength from these different

norms for adjudicating values and meanings. On the one hand, the different perspectives need to be out in the open, widely acknowledged, and respected for what they are – competing conceptions of the good. On the other hand, a vibrant democratic process does not require (and may be undermined) by adopting bioregional norms of authentic dwelling or by insisting on local ties of tradition and custom as the basis of a functioning polity as communitarians suppose. Rather what is needed is a capacity for shared learning – learning to co-exist in a shared space even if people share little else – a capacity buoyed but not bounded by geographic proximity and economic interdependence. Thus while a critical pluralist acknowledges and values different norms, the cosmopolitan norms of *demos* encourages a collaborative form of protected area governance through participatory social learning and pragmatic place-making.

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SESSION 3B VISITOR MONITORING TECHNIQUES

The benefits of using randomised experimentation rather than observational studies for visitor survey social research

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Visitor research reported in the literature includes numerous studies investigating the relationships between constructs such as service quality, satisfaction and loyalty. In particular, managers of recreational venues, including national parks, are interested in whether management interventions to improve facilities and services will cause improved visitor satisfaction and improved loyalty, such as behavioural intentions to visit again or recommend to others. This is important not only because these constructs can be used as key performance indicators to evaluate management performance, but loyalty can generate increased interest in nature conservation, revenue from fees, and political influence.

Although minor variations exist, most of this past literature can be summarized by the logical sequence that increasing service quality leads to increased satisfaction, and increased satisfaction leads to increased loyalty (Figure 1). This research has obvious implications for park managers trying to increase loyalty, especially when research can indicate which aspects of service quality will lead to the greatest increase in loyalty.

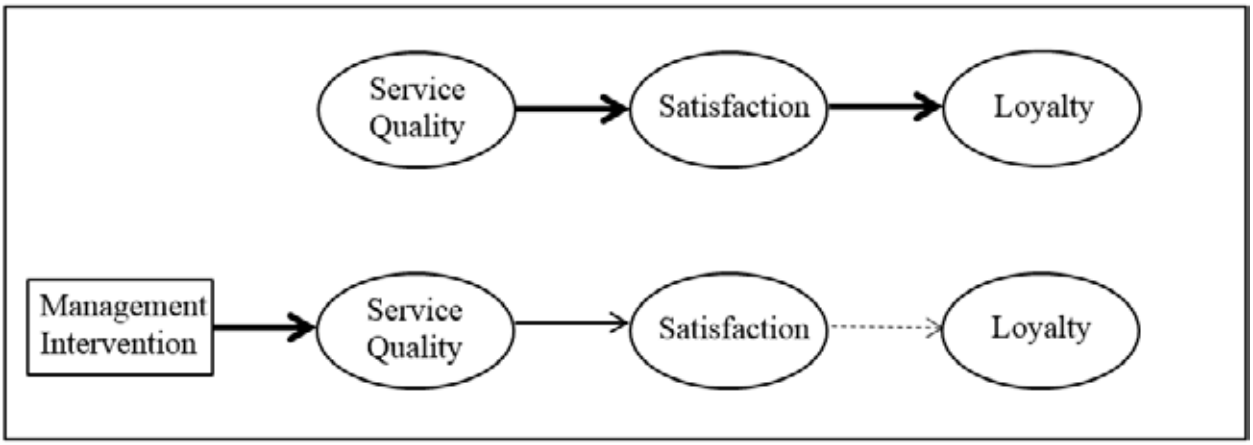

Figure 1. Cause and effects from observational studies in the literature (above) and from randomised experiments (below). Thicker arrows denote stronger evidence of relationships between constructs.

Data investigating relationships between service quality, satisfaction and loyalty is typically derived from visitor surveys, where visitors are asked to respond to Likert scale questions about these aspects. Statistical analysis can include techniques such as multiple regression and structural equation modelling. Most of these studies rely on observational studies to collect the data for these analyses while this paper provides a methodological critique of the benefits of using randomised experiments from statistical science.

Randomised experiments and observational studies

Randomised experiments refer to the situation where treatments are randomised to experimental units by the researcher. The key to analysis is to use this randomisation to inform the statistical analysis of the resulting data by comparing the estimated effect of the treatment from the observed data with the possible effect under different random allocations (assuming the null hypothesis of no treatment effect). Statistical significant results ($p < .05$) could be due to 'unlucky' random assignments (with 5% probability), but typically are taken as evidence against the null hypothesis.

Observational studies refer to the situation where no randomised allocation occurs, and usually no intervention at all, other than observing responses. In visitor studies observational studies are common but randomised experiments are rare, while both are common in mainstream science. In science, observational studies are often used to suggest effects and

randomized experiments used as confirmation. Randomised experiments are, however, not always possible since allocation of treatments is not practically possible or is unethical, especially in social science but often in science as well.

Despite general recognition that statistical correlations are not the same as causality, there are differing views over how causality can be inferred. Randomised experiments are generally considered scientifically superior to observational studies in science for determining causality (Ramsey and Shafer, 2002) but the use of structural equation models with observational data has been justified as a means for establishing causality in social science (Bollen and Pearl, 2013).

Using randomised experiments for visitor survey research

Scientific studies using randomised experiments into visitors' experiences in parks are extremely rare. Park *et al.* (2008) used a randomised experiment to conclude which management practices reduced the number of visitors who walked off trail in Acadia National Park (Maine, USA). Steckenreuter and Wolf (2013) used an experimental approach to test the contribution of persuasive information to visitors' compliance of fee payment in Kamay Botany Bay National Park in New South Wales (Australia). They found significant effects on compliance rates of park user fees from two treatments using messages on signage compared to a control. While both randomized experiments, the former study only investigated the effect on one visitor behaviour while the latter investigated the effect of the intervention on one specific loyalty behaviour (pay fees).

Investigation of relationships between service quality, satisfaction and loyalty using randomised experiments are notably absent from the literature, however those conducted by the authors have produced profound results. Their unpublished randomised experiments have found very strong evidence that some management interventions (i.e. treatments) caused changes in visitors' perceptions of service quality, but much weaker evidence that the interventions caused changes in satisfaction, and almost no evidence that this results in changes in loyalty (Figure 1).

Conclusion

The different result from observations studies and these preliminary randomised experiments have several implications for visitor research. First, assumptions concerning causal effects between service quality, satisfaction and loyalty require further scrutiny. Second, more randomised experiments are required in future research to address past emphases on using observational studies in visitor research. This imbalance juxtaposed against the situation in science suggests randomised experiments have a lot to offer visitor research, especially since it is generally recognized that randomised experiments provided stronger evidence of causal relationships than observational studies. They also more closely mimic what managers want to know: will an intervention improve satisfaction and loyalty? Third, since randomised experiments are typically more expensive than observational studies, social science research into visitor studies deserves increased funding so the level of scientific evidence can be improved to the level of their scientific counterparts.

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Monitoring the attractiveness of an UNESCO World Heritage region: identifying 14 million fans of the international Wadden area

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Introduction

Each year many visitors are coming to the Wadden area, an international natural and cultural coastal region, shared by Denmark, Germany and the Netherlands. It forms a shallow body of water with tidal flats and wetlands and stretches from Den Helder in the Netherlands in the southwest, past the North Sea coast of Germany to Esbjerg in Denmark along a total length of roughly 500 km and a total area of about 10.000 km². It is an area that has been intensively shaped by humans but is also one of the most valuable nature areas worldwide. In June 2009 the Dutch and German Wadden Sea was added to the UNESCO World Natural Heritage List, and in 2013 a nomination of the Danish part of the Wadden Sea was submitted. Against this background and by building on conceptual insights from the place attachment and governance literature (Mehnen *et al.*, 2013), this research takes a quantitative and monitoring stance and examines the attractiveness of this area through the use of an online Public Participation Geographic Information System (PPGIS) tool known as the Hotspotmonitor (HSM).

Vanclay (2012) argues that unique landscapes attract day-trippers and holidaymakers and that these people are also likely to develop a strong attachment to such places. Vanclay (2012, p. 149) highlights that "when landscapes and/or regions are significant biodiversity reserves, World Heritage sites or have significant cultural heritage values, or are highly socially valued for some other characteristic, many individuals may develop strong custodianship or stewardship notions over them, albeit vicarious, and feel they are a legitimate stakeholder in decision making about a specific location or landscape, even if they don't live there and sometimes even if they have never actually been there."

With Vanclay as our point of departure, we aim to answer two main questions in our research:

1) How many people are attached to the Wadden area and where are they coming from?
2) What is the character of their attachment?

Methodology

The Hotspotmonitor (http://www.hotspotmonitor.eu) is a web-based GIS program, which builds on the Google maps tool. It is connected to the SoftGIS approach, the 'value mapping' technique and to the trend to integrate the potential of GIS into Cost-Benefit-Analysis (Sijtsma *et al.*, 2012, 2013; De Vries *et al.*, 2013). Its function is to gather 'hotspots of landscape experience', places with high attractiveness in general, and attractiveness for specific experiences (peace and quiet, cycling, bird watching, etc.); the Hotspotmonitor was designed to measure preferences for nature or water and by doing so limits the possible answers of respondents. The central question is: Which places do you find very attractive, valuable or important? And why? Therefore, we operationalized place attachment. We understand and define in this case place attachment simply as a measure or indicator related to that central question. The respondent has marked a place, which is attractive, valuable or important for him. Hence, he is in some way attached to the place.

The current HSM version 2.0 is a first international version, and includes local, regional, national and recently identified worldwide hotspots. 7656 respondents participated in the trilateral survey initiated by the Dutch WaLTER project and the Dutch Waddenacademie, of which 1316 were from the Netherlands, 5275 from Germany, and 1065 from Denmark. The survey was set up to be representative for the three national populations, therefore respondents were asked from across all three countries. A balance was sought between a minimum number of respondents per country, a reflection of the size of the overall population in all three countries, and the available budget. The respondents were equally spread across the country: about 1/12 from every one of the 12 Dutch provinces, 1/16 from every one of the 16 German Bundesländer, and 1/5 from every one of the 5 Danish regions. Of the participants 49.3 % were women and 50.7 % were men from all age groups (>15 years old).

Results

14 Million Wadden fans

To answer the first research question we used respondents' home locations in order to analyse which areas within the three involved countries show the strongest appreciation for the Wadden (see Figure 1). Based on survey responses, we estimated the total number of Dutch, German and Danish people who find the Wadden an attractive, valuable or important place on a national scale. The overall total adds up to 14 million 'fans' for the three countries altogether. From a governance point of view, and the theme of the congress it is interesting to compare this number to the number of local inhabitants of the regions. Since the number of inhabitants is around 1 million, there are 14 times more Wadden fans than Wadden inhabitants. To achieve balanced governance involving all stakeholders (Mehnen *et al.*, 2013), it therefore seems a worthwhile aim to further connect these 'fans' to the area (Bijker *et al.*, (in prep.)).

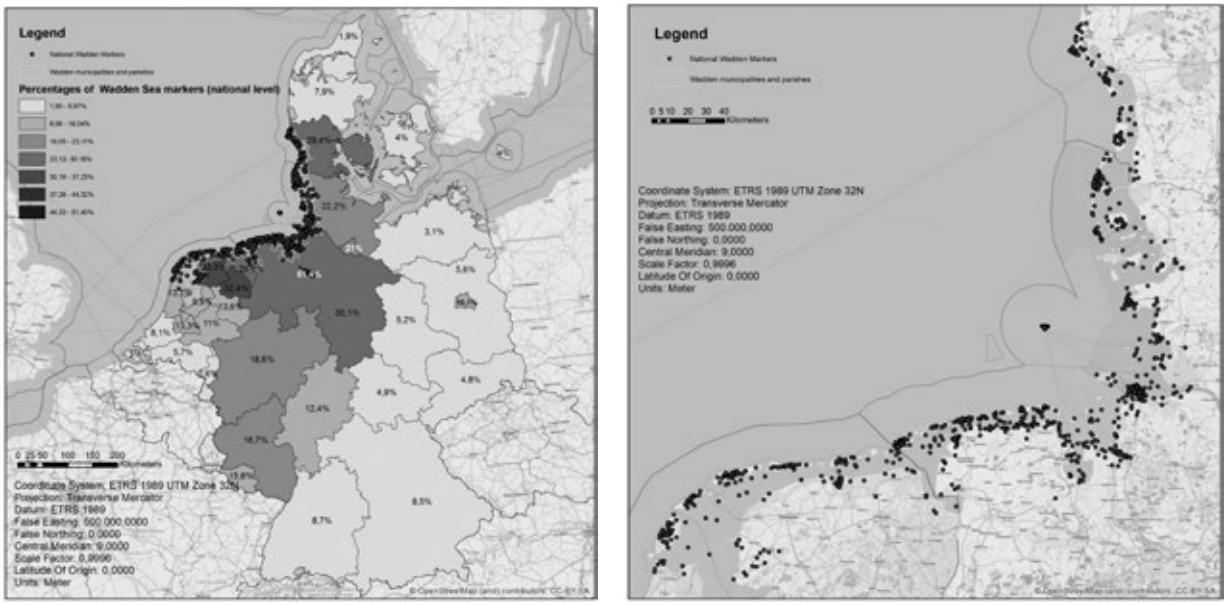

Figure 1: Percentage of Wadden Fans by Bundesland (DE), Region (DK) and Provincie (NL) and national Wadden markers

The attractiveness of the Wadden – nature, water and more

To answer the second research question, respondents had to answer several questions on the character of the attractivity. One female respondent from Bavaria marked a place on Sylt and stated "I love the rough landscape, the sea, the irrepressible nature and that it is so different from home" (ID 1086). She found the place very attractive (10). Her activities range from sunbathing and swimming to cycling, walking and nature watching. The paper shows systematic results on these aspects. In general, the Wadden Sea region is highly valued and appreciated in all three countries and the Wadden islands especially are attractive places. 2/3 of the markers are placed in the Wadden municipalities and parishes, hence either on the Wadden islands or the mainland municipalities; 1/3 are sea markers. Sijtsma *et al.* (2012, p. 147) have detected a spatial mismatch between the Dutch demarcation of the World Heritage site and areas that have proved to be attractive to tourists, because the UNESCO World Heritage site includes mainly the sea area and only a few parts of the Wadden islands; the paper also addresses this demarcation issue and will elaborate what type of areas are of specific interest.

Conclusion

The present paper has quantified the attachment of individuals to the World Heritage site known as the Wadden area. Our results have shown that the Wadden Sea region is highly valued and appreciated in all three countries – and to date, there are 14 million Wadden 'fans'. The paper has also presented the character of their appreciation; this method can be applied elsewhere to allow for comparative research across sites and indeed, the software is available for that purpose. From a governance perspective we have demonstrated that a potentially very large number of actors need to be considered when decisions are being made in relation to landscapes which are appreciated and protected (Vanclay, 2012; Mehnen, et. al., 2013).

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New ideas for monitoring visitors

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The aim of this project is to generate new ideas for identifying and monitoring visitors in recreational and natural areas by using crowdsourcing and location based data. A successful management of the use of recreational and natural areas begins with data about the visitor flows. It is important to know how many (and which) visitors use these areas, what the trends are and how the spatial distribution of visitors within these areas is and why. In this project we identify what methods and tools are already available and to what extent they are useful to generate and monitor location based visitor numbers. Four different methods are identified (on-site collecting, online collecting, modelling, tracking) but the focus in the project is on tracking.

On-site collecting

A traditional method is counting the amount of visitors at entrances, sometimes during a few days in a year or via electronic counting a whole year. Also counting with aerial shots is a method managers sometimes use. Also the amount of tickets sold at entrances can give information about the visitor flows, but a lot of recreational and natural areas are free of charge. Another way is counting the amount of sold parking tickets if a parking ticket is required. New technologies have been introduced by handling the visitor a GPS-device at the entrance to follow the visitor in his use of an area. On-site visitor data collecting are rather trustful, but costly. A result from a survey of nature and recreation managers in the Netherlands (Goossen *et al*, 2011) is that there are some, but limited recreation monitoring and/or counts of the visitor flows. The goal for those managers with these tools is that they want to have insight of yearly visits and/or opinions of recreationists about the quality of their areas. These tools consist of interviews, questionnaires on site, observations and sometimes counting the number of visits. Especially the managers of recreation areas are counting the visitor flows, mostly by parking tickets and sometimes with a traffic counter. Most organizations would like to have more precise data, especially the exact understanding of the number of visitors is desirable and how the internal spatial distribution of the visitors are. Organizations choose that method that is most in line with their targets. Other important argument is the price of monitoring and the practical usefulness of the method. Systematic counting is hardly done year around. Nevertheless, the interest of the organizations in location based visit numbers exists. It is therefore that seeking alternative innovative methods with limited budgets to collect such data is supported.

Online collecting

NBTC-NIPO Research asks the Dutch population about their leisure time in their continuous recreation activity survey (CVTO). Recreation activity is defined as a leisure activity during at least 1 hour, starting from home without an overnight stay and not including family and friends' visits. It could be an outdoor recreation activity, shopping, sporting or visiting a museum. The survey defines a total of 115 recreation activities. They use an online panel of 220.000 respondents. Every week about 350 respondents of that online panel are asked to fill in what kind of activities they have done during the last week. The survey time lasts one year (from May till April). From 2006 they collect data every two years (NBTC-NIPO Research, 2013). For the outdoor recreation activities the destination is asked. The destination is defined as the type of land use like a forest, a sea, a lake, a park or their own neighbourhood. The name of a forest is not asked, so the results are only useful to give insights into the popularity of the land use types. Visiting forests has been increased by 6% from 2006 till 2013. The results are important at national or provincial level because the investigation of the character of recreation activities and visitor flows at the destination level may lead to insights into how recreational, tourism, spatial and mobility policies can be adjusted and specifically focused on these destination-specific recreation activities and visitor flows.

Modelling

Models of recreation behaviour in large protected areas have been developed to predict the amount of visitors and their spatial distribution, depending on usage and infrastructure. These simulations have emerged as a suitable tool to capture the complex spatial behaviour of visitors in natural areas and to analyse the consequences of recreational use and behaviour changes (Gimblett *et al.*, 2001). The pool of studies that address the spatial and temporal distribution of recreation seekers with the use of simulations is growing rapidly (Gimblett & Skov -Petersen, 2008). Models as RBSim (Cole 2005), MASOOR (Jochem *et al*, 2008), kvintus.org (Skov -Petersen, 2005) are developed. The models are as good as the input (available data) is. They have proven to be useful for managers.

Tracking

The focus on the project is on an inventory of possibilities to use (open source) location-based data to count visitor numbers in specific areas. As the costs of technology continue to decrease, finding technological means to automate the tracking of visitors could not only lead to have insights into the total amount but also to understand the choices of visitors.

An increasing number of visitors are bringing smartphones when visiting. Smartphone penetration levels are continually increasing. Counting visitor numbers on the basis of data from mobile telecommunications networks is an interesting method, but very restricted because of privacy laws. Mobility measurements and counts must be based on absolutely anonymous and aggregated counts. Only one company in the Netherlands has a contract with a provider to use their data. The first result is that it is useful to have insights into the total amount of visitors (also tourists from other countries) at a municipal, provincial or national level but not on a sight level.

With the Activity Recognition API of Google it is possible to track users if they are logged in to specific apps with wifi technologies like geofencing, ibeacons and augmented reality. In the project we analyse the usability of these new technologies to count the amount of visitors. The first result is that a visitor would only download an app if the app delivers something useful for the visitor.

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Usefulness of GPS tracking in monitoring skitourers' activity in Tatra National Park, Poland

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Introduction

The nature of ski touring is to penetrate wild spaces and to move freely in open terrain covered with snow, which could lead to conflicts in the areas where many species of wild fauna can be met. These conflicts between recreational use of protected areas and nature conservation have been reported worldwide as well as in Tatra National Park (TNP) in Poland [Bielański 2013]. TNP offers a unique opportunity for skitourers being the only Alpine-like mountains within the whole country (culminating at 2499 meters above the sea level). Its size (21 164 ha) and very high visitation number (approx. 3,000,000 per year) are often a cause for exceeding its carrying capacity [Skawiński 2010]. Ski touring traffic is concentrating during the spring due to a longer day, sunny weather, low avalanche risk and sufficient snow cover. The peak months are March and April. Total number of skitourers' visits to TNP have recently reached 10 000 (December through May) [Bielański 2013]. Ski touring popularity has been growing in Tatras rapidly, which is a great concern for the park management since it tends to spread above the timber line in an uncontrolled manner. On the other hand, TNP regulations strictly define rules and trials designated for skitourers [Bielański, Cybula, Ziobrowski 2013]. Some incidents of illegal trespassing have been reported by the Park staff (TNP unpublished data, 2013) but no statistics on spatial nor temporal distribution has been provided.

In this study the authors attempted to use the GPS devices in order to recognize the spatial and temporal distribution of skitourers in TNP. The applied method based on experiences from other areas described by several authors [e.g. Taczanowska *et al*. 2008]. This led to creation of digital density maps, which allowed to define park areas with high concentration of skitourers as well as to estimate potential threats to natural environment such as crossing of wild fauna territories. Furthermore, due to the Park internal regulations it was important to identify the percentage of ski touring traffic outside the designated trials (illegal dispersion).

Methods

In order to create a digital map of skitourers' activity within TNP, GPS Loggers were distributed at four Park's entry points throughout the winter season of 2011. When the snow cover was melting down during the late spring, distribution points were moved to mountain huts located higher above the sea level (fig.1).

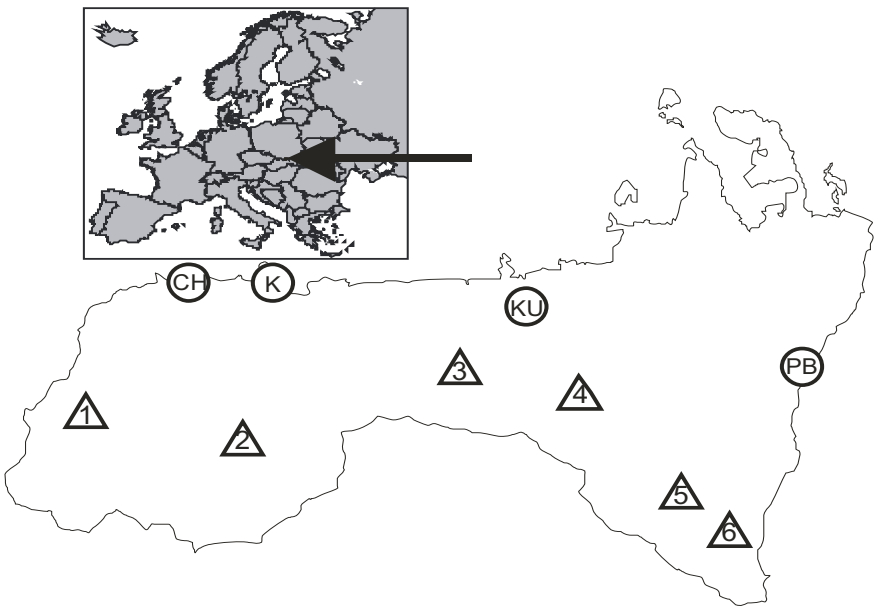

Fig. 1 Location of GPS Loggers distribution points in Tatra National Park GPS loggers distribution points:
entries / extits points: CH : Chochołowska Valley, K–Kościeliska Valley, KU – Kuźnice, PB – Palenica Białczańska mountain huts: 1 – Chochołowska, 2 –Hala Ornak, 3 –Kondratowa, 4 –Murowaniec, 5 –Pięć Stawów Polskich Valley, 6 –Morskie Oko

GPS logger device used in the survey was Hollux M-1000C. The position of the skitourers was registered every 120 sec. and/or every 50 meters. GPS loggers were collected into boxes attached at the entry/exit points in the Park that allowed for 24 hour return time. A total number of 343 tracks were successfully downloaded to a PC, and only 31 GPS tracks failed to be red. Subsequently, it was necessary to clear some artefacts, which occurred as a result of GPS signal reflection, which took place at the moment of starting up in deep mountain valleys. These kinds of artefacts were also observed when a skitourer stood still for a longer time.

Subsequently, the tracks were aggregated in ArcGIS 9.3 software and further spatial analyses were performed using digital maps of Polish Tatras (1:10000).

Results

Skitourers' digital traces allowed creating their traffic density map, which was a base to reveal the most popular spots in the TNP. Moreover the data collected with the GPS devices showed that the illegal dispersion rate reached 20%. In further analysis the authors also studied environmental impacts of skitourers. It was found that 19,25 % of the skitourers' traffic had crossed territories occupied by chamois and 24,15% of them interfered with marmots sites. In the high avalanche risk areas only 5% of the group were observed.

Discussion

One of the authors' fundamental concerns during this study was the issue of negative attitude of the researched group towards TNP authorities. This could have influenced the results if some skitourers had refused to take the GPS units planning to go off the designated trials. Such conflicts had been earlier observed in Tatras [Krupa 2006] and in the other national parks in southern Poland. Fortunately, in the study presented here the refuse rate occurred to be relatively low (13%). Moreover, the authors verified the results of GPS analysis by conducting a direct observation. Comparing results with illegal dispersion rate form neither of the sources revealed any statistically significant difference ($p>0,1$).

Interpretation of the GPS data analysis was also a matter of discussion. It is a case of the researcher's choice which method is more adequate for the subject of the survey. One method is to analyse a number of GPS points (e.g. beyond the marked trial area). Another is to analyse a number of the GPS tracks as whole lines. The second approach, taking into consideration the number of the whole tracks (as lines) would only give the information on how many of the observed persons were present in the analysed area but with no indication of its duration. This would lead to a conclusion that the person who was present in the analysed territory for only 5 minutes would be equal to the person who stayed there for few hours. The authors have decided to apply the first method (points), as the one showing the duration presence of skitourers, which seemed to be more adequate when considering the human impact on wild fauna (or illegal dispersion).

Conclusions

The use of GPS units in monitoring ski touring activity in Polish Tatras proved to be very accurate. Although it has some limitations and requires adequate interpretation it seems to be a helpful tool for the Park managers especially when considering visitors who tend to spread over the open spaces. The GPS tracks analysis also allowed identifying some spatial characteristics of skitourers' movements in Tatras that would be difficult or impossible to observe using the traditional methods.

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Monitoring the patterns of visitor use at World Heritage sites

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Introduction

During the last 40 years, since the adoption of the Convention Concerning the Protection of the World's Cultural and Natural Heritage, the World Heritage List has been growing with the most outstanding places on Earth. These places, called World Heritage sites, are properties established by the United Nations Educational, Scientific and Cultural Organization (UNESCO), containing the most significant natural and cultural values in the world.

Nowadays, World Heritage sites represent important travel destinations worldwide attracting millions of visitors every year. However, the fact that these places attract so many tourists presents a serious challenge regarding the protection of their natural, cultural, and recreational values, since with visitors participating in heritage activities, there is an eminent potential for the occurrence of different types of impacts. Visitor impacts are able to carry several consequences to cultural and environmental conditions, affecting ecosystem components and processes; through the degradation of the soil, vegetation, water, and wildlife resources (Leung & Marion 2000:24). As the World Heritage sites are classified, it is essential to find ways of controlling visitor related impacts, while trying to provide visitors with high-quality experiences and guaranteeing that local communities benefit from the existence of these iconic places.

An efficient way how to control and anticipate negative effects on site resources and ensure visitor expectations are corresponded is through visitor management. As such, visitor data is crucial. This is particularly so in Průhonice Park, a 250 hectare World Heritage site, located 15 kilometres southeast of Prague city, that due to its combination of outstanding values and privileged location receives an average of 155,000 visitors per year. The related impacts caused by thousands of visitors and their different uses raised management concerns, and the need to understand visitation dynamics within park spaces. As a result, a research programme was developed in order to monitor the visitor's experience in Průhonice Park through the understanding and analyses of visitor movement and behaviour patterns.

Material and Methods

Study area

Průhonice Park, classified as the UNESCO World Heritage site since 1992, is one of the crown jewels of the Czech Republic's national historical parks and an exceptional example among its style. Covering an area of approximately 250 hectares and with 30 km of trails, the park has a privileged location just 15 kilometres southeast of Prague city centre, making it easily accessible and a perfect destination for domestic and international visitors. The park has one of the most unique and interesting characters of landscape in the country, standing out for its special combination of ecological and cultural values, together with an important outdoor recreational component.

Methodological approach

The research was based on a combined system approach consisting of two parts: questionnaires and a GPS survey, which in turn was structurally divided into three main phases: data collection, survey analysis and data synthesis (Figure 1).

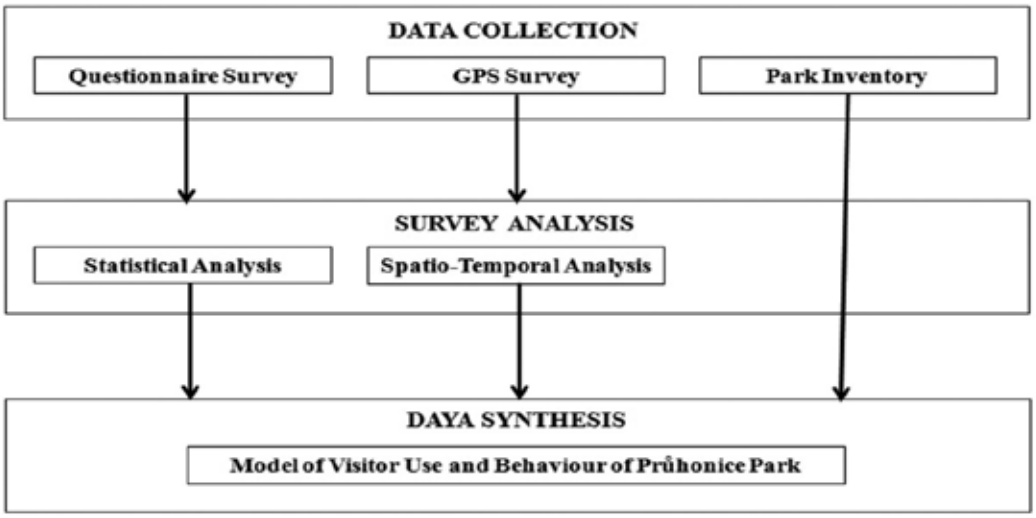

Figure 1 - Schematic representation of the methodological approach

During eleven random days in June 2012, visitors were contacted at the park's main entrance and invited to participate in the research survey before registration. If visitors decided to participate, they were introduced the research purposes and asked to fill in a simple questionnaire, which took between 5 and 10 minutes to complete. After that, one of ten available GPS-units was delivered to respondents and they were asked to carry it during the rest of their visit. Once visitors finished their visit, the GPS-units were returned to the survey representative and all data was stored into a Geographic Information System (GIS), in order to conduct all necessary spatial and temporal analyses. A total of 112 visitor surveys were completed. Afterwards, the GPS dataset was linked to equivalent questionnaires, more specifically visitor profile was related to the visit information, such as most popular places visited, preferred routes, time spent at each attraction, and the length and speed of travelling. In the end, results were overlapped with a GIS inventory of Průhonice Park, containing different values, attractions and facilities. This allowed the production of realistic scenarios regarding different typologies of visitors and their movement patterns, preferences and behaviours within the park.

Results

The findings allowed understanding that Průhonice Park is mostly used near the main entrance and visitors tend to spend between one and two hours in the park, covering an average distance of 4.2 km per visit. The highest visitor use was found near important cultural and natural attractions, such as the castle complex, podzamecký pond, alpine and botanical garden. Therefore, it was possible to identify different park areas according to their susceptibility of being crowded and zones where potential ecological impacts can appear due to human activities and relate them with the different visitor profiles.

Conclusions

While the limited number of response rate might represent a limitation to the study, the proposed methodology represents a step forward in the understanding of patterns of visitor use within protected areas. In fact, GPS recorded travel routes and associated questionnaires proved to generate robust, detailed, and accurate data. Thus, it was possible to record unusual travel movements within the trail system and potential sites of interest for visitors. This research shows how important it is for protected areas management to adopt long-term monitoring of visitor movement and use patterns in order to protect the natural and cultural values and improve visitor experience within World Heritage sites.

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Valuing abiotic nature - upgrading preliminary version of Geosite Assessment Model (GAM) by using Analytic Hierarchy Process (AHP)

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Besides living nature, flora and fauna, recent European leisure trends have shown heightened appreciation of non-living natural resources – geodiversity, which can be presented to the tourists in the form of geosites. The evaluation of geosites has been developing since the 1990s in terms of their interpretative potential and provision (Hose 2000). Preliminary Geosite Assessment Model (GAM) was developed from several existing evaluations, which lead to the numerical assessment criteria proposition from extant literature in the field (Vujičić *et al*. 2011). According to modification of existing models (e.g. Reynard *et al*. 2007, Pereira *et al*. 2007, Zouros, 2007, Pralong 2005) that specify two groups of indicators – scientific and additional, GAM proposed main and additional values.

The first group, main values, comprises three indicators: scientific/educational, scenic/aesthetical and protection values. The first indicator in main values group is scientific and educational value (VSE) with additional component "level of interpretation" as key element for understanding and explanation of geodiversity to wider audience and non-specialists. In contrast to before mentioned references, scenic and aesthetic values (VSA) are by GAM identified as main values, as they are relatively constant in time and not significantly human-influenced in general. This indicator was mostly created after Pralong (2005) with an addition of "environmental fitting of the site", e.g. if a certain manmade outcrop fits to its natural surroundings. Protection (VPr) is presented as indicator of main values, it should be essential activity before any promotional or tourism development in general.

The second indicator group of the geosite assessment model, additional values, is further divided into two indicators, functional and touristic values. Some authors previously proposed some functional elements such as (e.g. Accessibility, Pralong 2005, Pereira *et al*. 2007 Zouros 2007), but for the purpose of this paper and model Functional value (VFn), was further developed and it consists of six elements. New elements that were added are additional natural values, additional anthropogenic values, vicinity of emissive centres, vicinity of important road network and additional functional values. The purpose of these elements is not tourism development and they do not directly contribute to tourism, but are essential.

The second indicators in the group of additional values, are Tourism values (VTr) and they evaluate the current state of (geo) tourism services and facilities. Several authors proposed some elements of the tourism values - e.g. equipment and support services as a part of Use value (Pereira *et al*. 2007), management measures (Reynard 2007), economic potential as a potential for use indicator (Zouros 2007), annual number of visitors and attraction as part of economic values (Pralong 2005). In contrast to the previous models, GAM offers tourism values as independent indicator with nine sub-indicators (Promotion, Organized visits, Vicinity of visitors' centre, Interpretative panels, Number of visitors, Tourism infrastructure, Tour guide service, Hostelry service, Restaurant service).

In total, there are 12 sub-indicators of Main Values, and 15 sub-indicators of Additional Values.
GAM = Main Values (VSE+VSA+VPr) + Additional Values (VFn+VTr)

As all sub-indicators are not equally important to the professionals (researchers, academicians etc.) and tourists, authors upgraded GAM by using Analytic Hierarchy Process (AHP), which is one of the most popular tools in decision-making processes and developed new grading scale for sub-indicators. The AHP approach is used to construct an evaluation model and it has criterion weights. It integrates different measures into a single overall score for ranking decision alternatives. Applying it usually results in simplifying a multiple criterion problem by decomposing it into a multilevel hierarchical structure. This model is structured as a set of pair-wise comparisons of decision elements made by the decision maker. At the top of the hierarchy is the goal, the next level contains the criteria, while alternatives lie at the bottom of the hierarchy. Figure 1. shows hierarchy from most important to least important sub-indicator: 1) Rarity, 2) Knowledge on geoscientific issues, 3) Representativeness, 4) Level of interpretation, 5) Environmental fitting of sites, 6) Surrounding landscape and nature, 7) Accessibility, 8) Current condition, 9) Additional natural values, 10) Promotion, 11) Vicinity of visitors centre, 12) Interpretative panels, 13) Viewpoints, 14) Additional antropogenic values, 15) Vicinity of important road network, 16) Vulnerability, 17) Organized visits, 18) Tourism infrastructure, 19) Protection level, 20) Vicinity of emissive centres, 21) Surface, 22) Additional functional values, 23) Tour guide service, 24) Number of visitors, 25) Suitable number of visitors, 26) Hostelry service, 27) Restaurant service. Based on the preliminary results of the assessment, which were performed using Expert Choice 2000 program, new matrix can be formed. First results indicate that the most relevant criteria are Rarity

(criterion weight 0.186), Knowledge on geoscientific issues (0.139), Representativeness (0.135), while the least important are Suitable number of visitors (0.004), Hostelry service (0.004) and Restaurant service (0.004). Consistency ratio (CR) is 0.03, which indicates that the study is reliable and accurate enough and there is no need for further adjustments in the comparison (Figure 1).

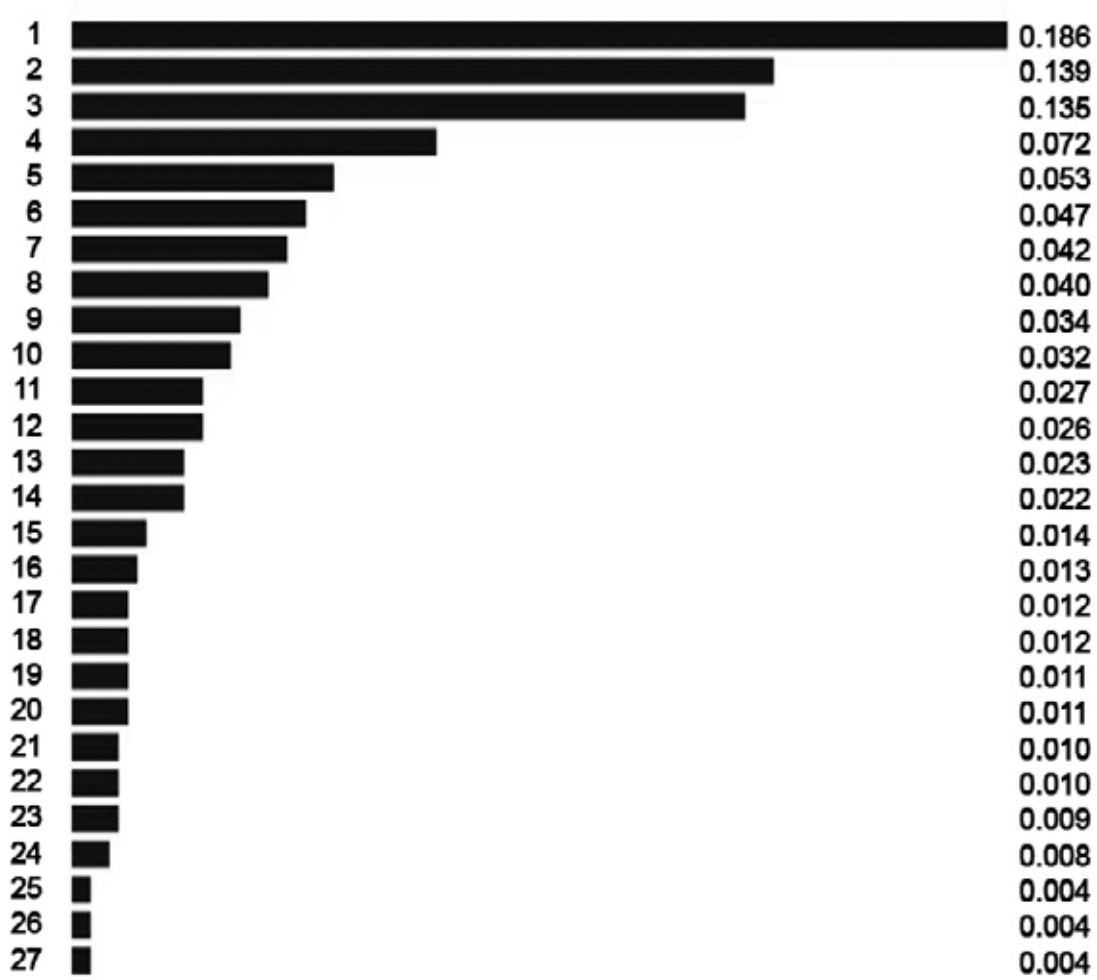

Figure 1. Re-evaluation of sub-indicators by using AHP (Expert Choice 2000 program)

Based on the results of the assessment, a matrix of main and additional values can be created, where these values are presented via X and Y axes respectively. The matrix is divided into nine fields (zones) that are indicated by Z (i,j) (i,j=1,2,3) based on the grade they received in the previous evaluation process. Geosites that fit in cell Z31 and Z32 have high scientific, aesthetic and protection values, but low developed tourist and functional sector. With that scenario the best way would be that managers promote, plan and enhance mentioned assets, while not degrading the first one. The next scenario is that geosites fit in Z11 and Z12 cell and have low main values and also low additional values. In this case there can be two possible solutions: the first one is that the geosite has no main values, and because of that additional values are also low; the second scenario is where the geosite is not fully researched and because of that is not protected, which implies that there is no need for additional values. Geosites that fit in Z33 and Z23 have high ratings in main and additional values. These sites are already developed tourism sites and managers should measure the impact of tourism and threats with constant monitoring of proposed sub-indicators.

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SESSION 3C UNDERSTANDING VISITOR NEEDS

Identifying health and wellbeing benefits perceived by visitors in Finnish protected areas

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Introduction

A growing body of research indicates that contact with nature has diverse and profound benefits on human health. Regular and short-duration physical activities in green spaces contribute to immediate mental health benefits, such as improved self-esteem and mood (Barton & Pretty 2010). Contact with nature helps to cope with and recover from stress and promotes social relations (Maller *et al*. 2008). Green spaces improve motivation for exercise, resulting in higher activity levels (Karjalainen *et al*. 2010). Furthermore, natural settings provide inspirational spaces for recreation. However, Maller *et al*. (2008) have pointed out a lack of research demonstrating health opportunities and benefits specific to protected areas.

Metsähallitus Natural Heritage Services (NHS) manages Finnish national parks and other state-owned protected areas. NHS works to improve public well-being and the viability of tourism, as well as the state of biodiversity in Finland. In 2010, NHS launched Healthy Parks, Healthy People Finland programme that aims to improve public health by activating people to get out into natural settings, enjoying positive and genuine experiences and improving their physical health through a wide range of outdoor activities. The key aim in the programme is that health benefits resulting from the use of protected areas are effectively monitored and measured, so that the findings can be used to enhance services. Better understanding of the health benefits also affects decision-making and funding becomes available from more diverse sources. Project OPEN (Oulu Parks, Enjoying Nature) included an action to develop methodology to survey the health and well-being benefits provided by natural settings.

This paper describes the design and preliminary results of a survey that identifies health and well-being benefits perceived by Finnish protected areas' visitors.

Survey design and implementation

The survey design began in late 2012 with two priorities. Firstly, new information was needed to verify and monitor the overall effectiveness of parks in provision of health and well-being benefits. Secondly, in order to enhance the quality of visitor experience on a protected area level, NHS aims for better understanding of connections between attributes related to protected areas, their users and various dimensions of health.

Utilizing NHS' experience in visitor monitoring, the chosen approach was a modified visitor survey to provide information on the subject. To complement traditional visitor surveys implemented on-site, two survey types were created: a small set of questions (see table 1) in conjunction with the visitor survey on-site questionnaire, and an extensive web questionnaire to be filled approximately one week after the visit. The web questionnaire was designed based on previous research on impacts of nature on human health and in particular on experiences of Lemieux *et al*. (2012) within Canadian protected areas. It covered following sections:

- relationship with nature and particular area
- mental, social and physical health and well-being
- duration of effects
- valuation of effects
- perceived effects on children

The survey was field-tested in 2013 jointly with the visitor surveys conducted in four protected areas representing different regions of the country: Kurjenrahka, Patvinsuo and Repovesi National Parks and Kevo Strict Nature Reserve. Approximately 143 000 visits are made to these areas annually. Respondents of the visitor surveys (n=2 052) were asked to

provide their email address for subsequent delivery of the link to the questionnaire. The questionnaire link was sent to 1 197 respondents who had registered their email address. Within them, the response rate was 73 % (n=871). Research staff in Oulu Deaconess Institute were assigned to data analysis and reporting the results.

Preliminary results and discussion

The preliminary results indicate that the health and well-being benefits perceived by visitors were very positive in all study areas (table 1). The benefits match visit motivations well, since over 80 percent of respondents considered relaxation, mental health and well-being and being together with own group important. The impacts were independent of respondents' characteristics, such as education level, age, body weight or reported health. According to the results of the web questionnaire, visitors in groups perceived more health and well-being benefits than single visitors. In addition, increase in the duration of the visit had positive effect on the duration of effects. The results indicate that visiting protected areas can be considered as a health enhancing activity for the whole population. The findings are consistent with conclusions made in Canadian studies by Lemieux *et al* (2012).

Table 1. The health and well-being benefits perceived by the visitors of the parks. (5 = totally agree – 1 = totally disagree). Source: on-site visitor surveys in 2013.

Question: How did this visit to the protected area influence the state of your health and well-being in the following sectors?	**Responses**		**Evaluation, %**					
	n	**%**	**totally disagree**	**some-what disagree**	**no opinion**	**some-what agree**	**totally agree**	**Average**
Increased social well-being[1]	2011	98	0	2	14	40	43	4,24
Increased psychological well-being[2]	2007	98	0	1	8	39	52	4,41
Increased physical well-being[3]	2010	98	0	1	9	38	52	4,41
1. i.e. strengthened social relations, improved working capacity, enjoyed doing things alone or together								
2. i.e. satisfaction with life, improved mood, recovery from mental stress, learned something new								
3. i.e. enjoyed sensing the nature, maintained the fitness, learned new skills, physical well-being								

An exploration of health benefits can be a very useful addition to visitor monitoring implemented in natural settings. This enables systematic, long-term and nation-wide approach in monitoring the benefits. The web survey provides important additional data to estimate the benefits in depth and to enhance services on-site. The evidence provided by the surveys helps in demonstrating and communicating the importance of nature experiences, e.g. how important it is to provide citizens with possibilities to experience nature. In addition to the health benefits perceived by visitors, it would be important to obtain information of economic significance of health benefits related to recreation in protected areas. International and cross-sectoral expert co-operation and scientific research is essential in developing new approaches to exploring the various dimensions between nature and health.

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Understanding mountain bikers' choices of recreational settings

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This research seeks to identify the range of site attributes that attract experienced cross-country mountain bikers to certain locations. Schreyer *et al*. (1985) conceptualize the interplay of motivation, behaviour *and* environment that leads to a satisfactory recreational experience; riding environments, and their individual characteristics, therefore play an important role in enabling mountain bikers to meet and exceed their personal ambitions and expectations. Riders' preferences for trail settings or features have been explored by a limited number of studies (Cessford, 1995b; Goeft and Alder, 2000; Bowker and English, 2002; Gajda, 2008); many of these studies are now quite dated and it is argued that more sophisticated bike technology, and greater consumer expectations, have advanced riders' preferences.

This study was relatively unique in comparison to this extant literature in that it employed a qualitative research method, whereby semi-structured and open-ended interviews, with bikers in the UK and New Zealand, facilitated greater depth of response. Employing a pragmatic general inductive method of analysis, the findings are consequently punctuated with rich and vivid participant quotes to illustrate their feelings on this emotive subject. The conclusions of this research not only further scholarly knowledge on this subject, but also augment previous quantitative studies through more applied implications for land management and trail development.

Research Findings

Participant reaction substantiated that there is a wide range of attributes or factors that attract mountain bikers to specific settings where participation can satisfy their motivations. Riders generally seek a combination of site attributes to realise their motivations, even if some characteristics are deemed to be more desirable than others. Furthermore, those attributes that are perceived as preferable can vary depending on the individual's needs and desires, and temporal fluctuations in the motivations for participation. While some of these characteristics are tangible, such as amenities, others are more perceptual and less easy to define.

Fast, Flowing Singletrack: Mountain Biking Nirvana?

When asked to name some of the characteristics of a great trail, many interviewees extolled the attraction of riding on narrow singletrack trails. 'Fast and flowing' was often used to describe ideal singletrack, as a trail characteristic that enables participants to strike up a good rhythm; it is difficult to reconcile speed with a trail that keeps interrupting your momentum. 'Thrilling', or a relevant synonym, was used by many of the interviewees to describe trails, especially those purpose-built for mountain biking.

Purpose-Built Centres: Commodifying Mountain Biking?

It was suggested that purpose-built mountain biking centres have a number of key advantages over traditional trails. These centres are often situated in forests and consequently have all-weather, year-round trails. A further advantage of trail centres is the variety of trail types within a single location, a desirable characteristic for mountain bikers (Sumathi and Berard, 1997; Gajda, 2008).

The proliferation of purpose-built trail centres throughout the UK with a range of facilities, such as cafés and shops, has arguably raised people's expectations, and many interviewees considered such facilities desirable. Many participants in New Zealand, where trailhead facilities are less common, were less enamoured. This suggests a possible conflict between the motivations of different riders that places even experienced bikers on different points of the hard-soft adventure continuum. One of the greatest characteristics of a trail centre, according to interviewees, is the lack of potential conflict with other users on the trail, a subject that has received much attention (Ramthun, 1995; Carothers *et al*., 2001; Brown *et al*., 2008, for example).

Traditional Rights-of-Way: A Different Type of Experience

Traditional rights-of-way, or multiple-use tracks, are considered to have a number of features that can make them preferable to purpose-built biking trails. They can offer a greater sense of exploration, whether perceived or real, a quality that is felt by some riders to be missing from purpose-built trails, which are often well signposted and sited in plantation forests. Traditional trails can often feel more adventurous, with a destination as a focus and an element of the unknown.

A third advantage identified of traditional trails relates to the great scenery to be enjoyed. Native landscapes, rather than commercial forests, are identified as the preferred settings for many bikers (Sumathi and Berard, 1997). Many participants,

in both New Zealand and the UK, considered great scenery to be an important environmental attribute, and while some participants considered scenery to be of secondary importance to the trail itself, they nonetheless conceded the importance of aesthetic values.

Management Implications

The popularity of purpose-built trail centres undoubtedly has foundations in the perception of these locations as great riding environments. Offering a condensed 'adrenalin hit' through the provision of often relatively short and easily-navigated trails, many centres are increasing their range of high-quality trails, to create a great experience for riders of a range of abilities. The associated facilities serve increasingly sophisticated expectations and help to create family-friendly destinations that widen their customer appeal.

Many more experienced riders, however, while appreciating the attraction of such centres, embrace the adventure and challenge of riding on tracks away from purpose-built centres, and prefer their more natural aesthetics. In order to maintain this, sometimes perceived, wildness an appropriate level of information for planning rides should be provided, but without great intrusion upon the trail.

The research confirms that mountain biking is widely perceived as a sociable recreational activity, and, through the creation of suitable facilities, land and trail managers should embrace opportunities for taking advantage of this desire to swap post-ride stories, tell (tall) tales of crashes and near-misses and increase riders' 'social capital'.

Conclusion

It is a diverse range of factors that attracts mountain bikers to destinations, and responses suggested that mountain bikers do not generally seek one particular attribute, even on a single ride. While physical site attributes can be purely functional, many serve to satisfy the hedonic motivations that attract people to participate in what is still, for many, the ultimate mean of experiencing the great outdoors. While the quality of the trail may be the prime characteristic for many riders, and more experienced bikers may embrace the rawness of wild trails, land and trail managers need to recognise and cater for an increasingly demanding and heterogeneous group of consumers.

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Handicapped opportunities on public beaches, example of Stroomi beach

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Introduction

More and more people talk about the creation of opportunities for different groups in society. Accessibility to services is different for the disabled persons in the context of participation in the community life. Nowadays the problems of disabled persons and their leisure activities are addressed. However, there is no information about the usage of public beaches for recreation and leisure by the people with disabilities.

The wheelchair-people say that there are wheelchair-adapted facilities for handicapped. As soon they go out of the house, every step reminds them of their disabilities. We should move toward universal accessibility, people with any ability would be adopted by the society. (Miles & Priest, 1999). Young people with disabilities want the same things as their non-disabled coeval, at least accessible opportunities. (Richardson, 1997: 1270). The wheelchair is the primary compensatory tool for people who have reduced muscle strength in the lower limbs, paralysis of the legs, or advanced age. (Franklin jt. 2006: 96). The wheelchair allows people to sit, move, communicate, work and be where a person wants to be and do what he wants to do. (Christiansen, 2005: 12).

This work focuses on opportunities of swimming in public beaches for people with reduced mobility. It describes the subjective experiences and evaluations through the available options. The aim of the research was to clarify if Stroomi beach as a public beach offers leisure services for disabled people.

The survey assessed if disabled people are guaranteed the opportunity for bathing and what are their problems and limitations.

Results

Firstly, Stroomi beach observation was done to fix the condition of the beach buildings and servicing capability of the infrastructure.

It was originally planned to carry out the questionnaire using the convenience sample. However, when searching for the target group, it appeared that the number of suitable candidates is limited. People who spend their free time on the beach for a swim, are hard to find. The author had to decide in favour of the interviews.

The interviews were designed to explore the thoughts and ideas of the disabled people, to find out how the participants see and assess the situation themselves. It also tried to find out whether disabled people themselves are interested in using the beach services.

Three interviews were carried out, transcribed and analysis of important ideas brought out.

Conclusion

The planning and building of infrastructure for people with special needs are taken into account, but created opportunities and solutions are incomplete and do not meet the standards.

The ramps have too large allowable angles. They are hard to drive by wheelchair.

Based on the research work carried out, the author makes the following suggestions for improvement.

Firstly, one has to maintain and improve roads and bring them in line with regulatory standards.

Another important suggestion is to improve the accessibility of toilets, reconstruct the ramps and install fencing in accordance with the standards.

Finally, the author proposes to investigate the possibility of using floating wheelchairs further. This solution seems to be the simplest solution allowing swimming for disabled people.

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Disabled people perceptions of Estonian nature trails

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The heightened social responsibility and growth of the tourism industry attempt to overcome many of the practical and cultural obstacles that people with disabilities face. In park management access of disabled people is more and more under concern and in tourism accessibility market is considered as one of the rapidly emerging market segments. The accessibility market includes people suffering from some form of disability as well as the ageing population, which often develops illnesses that lead to disability (Buhalis and Michopoulou 2010, Eichhorn *et al* 2008). Global competition, legislation and the increasingly ageing population demonstrate that competitive tourism destinations and organisations should undertake steps to improve their accessibility and to provide appropriate service and information conservatively estimated to 500 million people with a disability (Pühretmair 2004, Daruwalla and Darcy 2005).

In Estonia development of access for people with disabilities has been slower than in many other countries, because just some 25 years ago while being part of the Soviet Union Estonia did not officially have people with disabilities, because officially "the soviet nation was a perfect nation without any disabilities". By today Estonia has implemented EU regulations connected to wheelchair accessibility and also nature trails in Estonia are designed to be accessible by wheelchairs.

The purpose of this study was to test four nature trails, which were built or renovated in 2013 with disabled people in wheelchairs to find out their perceptions and satisfaction. The trails were selected from different biotopes and different parts of Estonia with logistical ability for one day visit. First two nature trails were located in Northern Estonia and other two trails were located in Soomaa National Park in South East Estonia.

1) Nature trail of the Viru bog in Lahemaa National park, which introduces the Estonian typical raised bog habitat (wheelchair access for 1, 4 km);
2) Sõõriksoo nature trail in Harju County, which introduces spruce forests and formerly cultivated peat bog with old peat pits (1,4 km);
3) Riisa nature trail in Soomaa National Park, which introduces the bog (wheelchair access for 1,2 km);
4) Beaver trail in Soomaa National Park (wheelchair access for 1,2 km), which introduces floodplain forest, beaver population, flooded meadows.

Methods

In order to get feedback from disabled people 7 persons from Estonian wheelchair floorball team tested all 4 nature trails on the 13th of October 2013. Participants experienced nice Estonian autumn weather between 11 to 13 degrees Celsius with sunshine and with no rain. One female and 6 male participants between 20 and 39 years had interview questions beforehand and they made some notes during the visits. Some days later all participants performed in depth interviews. The tour lasted a full day including also 5 hours bus ride in total.

Results and discussions

Four respondents visit nature at least once in a week and three respondents just a few times per year. It was dependent on a location of respondent homes, those who lived close to nature had a chance to visit nature more often than those who had some distance to nature from their homes. Two respondents had visited nature trails before, but no one of the respondents had visited and had not heard about the test trails in the current study before.

About the expectations for the nature trails the respondents answered that the main aspects were good accessibility, interesting and special environment, which was not possible to see daily. Also good information and educational approach was mentioned by all the respondents.

All the respondents were very happy of the existence of the trails and possibility to visit nature in specially designed trails. The respondents were satisfied with the information provided on the information boards. All the boards were well readable technically and contextually. The width of the trails perceived to be good and there were enough wider places for wheelchairs to pass.

Highlights of the tour were for respondents the viewing tower on Viru Nature trail and Beaver trail (Figure 1), which were in 1,5 height to allow access also in flood times. "*It was very interesting, the height of the trail made it like some real adventure course for wheelchair people*" (33 years old male respondent). The respondents liked the bog habitat in Viru and Riisa trails with bog pools, colours and smells. The least preferred trail was Sõõriksoo nature trail, because respondents said that it was *"too usual forest"*.

Figure 1. Beaver trail in Soomaa National Park

Technically the respondents found the main problem to be the accessibility and comfort of toilets. In Riisa and Beaver trail just moving one blank a little could improve the accessibility and comfort a lot. In Riisa and Beaver trails respondents mentioned also a metal net on the top of the wooden trail as a disturbing and uncomfortable thing. The net is placed to avoid the slippery trails when those are wet. Because the weather was dry and sunny the respondents did not have a chance to experience the efficiency of the nets.

Conclusions

The current study demonstrated that disabled people are willing to explore more nature than they have a chance and they are very delighted of the existence of nature trails with wheelchair access. Respondents expected to experience something special and unusual in nature trails and they were not keen to learn about "too usual forest". The respondents admitted also that there could be more cooperation in trails' planning and building process, because with some small change comfort of using the infrastructure could be raised a lot. Misunderstanding of the necessity of some details (like the net avoiding slippery) and lack of the information about the existence of the nature trails shows that with more information sharing there is a good chance to rise the visitation and satisfaction of the trails.

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SESSION 3D DEVELOPING INDICATORS FOR NATURE-BASED RECREATION AND TOURISM

Recreational indicators in the Danish National Forest Inventory – experiences and results

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Several international processes aim to monitor the forest status, and the political focus on the recreational/social function is increasing – as well as the demand for cost-effectiveness of the monitoring efforts (e.g. Sievänen *et al* 2008, 2013). This paper describes, to our best knowledge, a unique forest recreation monitoring approach, which is part of the compulsory national forest inventory.

The Danish National Forest Inventory (NFI) is based on a 2 x 2 km grid, with a cluster of four sample plots placed in each corner of a 200 x 200 m square in each grid cell. One fifth of the sample clusters are monitored each year. Before including recreational indicators on a permanent basis, a trial inventory was accomplished in 2006-2007. This trial identified 11 recreational indicators, including e.g. trails, hunting facilities and litter, which was meaningful seen from a recreational point of view and manageable in the existing inventory system. The paper presents results founded on a total of 4,138 forested clusters inventoried in 2008-2012 which makes up the first full sample circuit (Suadicani *et al* 2013).

Design of the Danish National Forest Inventory. Clusters of sample plots are placed in a 2x2 km grid. Each cluster contains four sample plots placed in the corners of a 200x200 m square.

It was e.g. found that hunting facilities were present on 27% of the clusters; forest roads/trails on 35%, while tracks were found on 17% – indicating access facilities are present in more than half of the Danish forest area. The presence of other outdoor recreation facilities, like campgrounds and fireplaces, were more limited (6%). An interesting observation is made in relation to conflict management: only in 1% of the clusters there are coincidences between hunting facilities and other recreational facilities. By further analysis, the results can be related to e.g. ownership status and geographical/administrative regions.

It is revealed that national forest inventories can be relatively simply and cost efficiently expanded to include a number of recreational/social indicators, which generally is not available otherwise. The continuity of the measurements will be a valuable addition to sustainable knowledge-based management and policy decisions.

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Indicators for sustainable recreational use of forests and other natural resources– experiences from Northern Europe

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Introduction

The sustainability concept is based upon the principle that current resource uses need to be in balance so that future uses are not threatened, and that future generations have the same opportunities to use and benefit from natural resources as the present generations have. The state of balance should be known and possible to define, and when agreed upon, development and changes over time should be monitored. When monitoring is required, there is a need for efficient measures (indicators) to describe the state of sustainability, the phenomena in question and associated changes. Among nine North European countries, a project 'Social indicators in forestry –further development in the North European context' (SOSIN) was conducted in 2012-2013 in order to assess suitable indicators for sustainable recreational use of forests and other natural resources. The project produced a state of art report of used and proposed further development of recreation indicators, and recreation monitoring (Sievänen *et al*. 2013).

Results of reviewing state of art of recreation indicators and monitoring in North Europe

The first topic was to report how nature-based recreation and tourism is represented in policy documents, and whether any statements exist, which support use of indicators and monitoring for the purpose of sustainable recreational use of natural resources or land use. The results show that most countries have policies for (i) sustainable forestry, (ii) preserving biodiversity, and/or (iii) sustainable tourism. Most countries were able to put forward policy documents, which are related to natural resources, tourism, land use planning or health sector, and in which nature-based recreation and/or tourism are mentioned as having a role in the sector. The most typical type of document was a national forest program or strategy. Only four countries (Denmark, Finland, Norway and Sweden) have a specifically focused strategy or program for outdoor recreation and/or nature-based tourism.

The second topic was to collect lists of indicators presented in official documents or in other literature such as study or review reports of recreation indicators. Most countries report some indicators related to recreation. In Denmark, Scotland and Sweden, several different indicators are found in different documents. Norway has some official outdoor recreation indicators, but not specified for forest recreation. There is a lot of variation between the existing indicators, and there doesn't appear to be one that is common in terms of scales of measurement or limits of applied type of nature area to all countries. The list of indicators adopted in 'official documents' is surprisingly short. Indicators such as 'extent of open public access', 'proportion of population participating in outdoor recreation', or 'number of visits to forests' are most common. More indicators are related to demand of recreation than to supply of recreation opportunities. The summary of most often mentioned indicators is in table 1.

The third topic for reporting was the sources of data and information that are used for monitoring recreation indicators. The objective was to determine who is responsible for the provision of monitoring data, what is the quality of the data and whether the data is updated systematically. Most countries report that there is some kind of monitoring system or database, which is or could be used for monitoring recreation indicators. Many countries also report that there is some systematic data collection both at national and local level, and both from demand and supply perspectives. But in most countries the data collection is not primarily for monitoring nature-based recreation. Only Denmark, Finland, Norway and Scotland can report having especially focused monitoring for outdoor recreation nationwide. Estonia, Denmark, Finland and Scotland have regularly conducted on-site visitor surveys, but the local or on-site level monitoring is mainly concentrated on state owned areas. Denmark and Scotland have the best coverage of visitor surveys and counting. Denmark, Estonia, Finland, Norway, Northern Germany and Sweden gather outdoor recreation related statistics with surveys such as Living conditions, Time Use, Environmental awareness, Culture and Leisure, or with general National Statistics such as in Germany.

Most countries do not, however, monitor sustainability of nature-based recreation and tourism systematically over time. Most countries were unable to provide information on indicators or monitoring systems for evaluation and assessment of recreation. Some countries, do however, report good progress in their efforts to monitor recreational use of forests,

particularly in protected areas.

Table 1. Summary of most often mentioned recreation indicators.

Recreation Indicator	**Number of countries** (Denmark-DK, Estonia-EST, Finland-FIN, North Germany-GEM, Norway-NO, North-Western Russia-RUS, Sweden-SWE, UK (Scotland); max 8)	**Remarks**
Proportion of populations who take part in outdoor activities	DK, FIN, NOR, SWE, UK(Scotland) = 5	number of activities measured varies between countries
Visits to woodlands/ national forests/different types of nature areas/ national parks and state owned hiking areas	DK, EST, FIN, NO, UK = 5	destination type and amount/size of destination areas differ between countries
Proportion of adults who visited woodland/ forest/nature area in previous 12 months	DK, FIN, UK = 3	destination type varies
Number and length of core paths in woodlands/ recreation trails (for walking, hiking, cross-country skiing)	FIN, UK = 2	type of paths or trail vary
Proportion of population with short distance to local green areas	NOR, SWE, UK =3	the definition of 'short distance' vary 300 m/ Sweden, 500 m/UK
Extent of open public access (Europe Forest indicator); everyman's rights	DK, EST, FIN, NO, SWE, UK= 6	everyman's rights vary slightly between countries

Conclusions and Discussion

The project identified several problems with current social indicators of nature-based recreation and tourism. In most countries, the relevant indicators are not feasible and effective to offer reliable information of on-going changes. The major problem in most countries is that there is a serious shortage of reliable data to provide quantitative figures for social indicators. On the other hand, there is still limited coherence and no agreement, which could be the best recreation indicators to be used on Europe wide, national or local level. According to COST E33 reporting, most European countries lack efficient monitoring systems to offer estimates of indicators across time and regions (Sievänen *et al.* 2008). Recreation monitoring is taking place in most North European countries to some extent, but less so in other parts of Europe. There are efforts to include recreation measurements into forest inventory systems (Danish National Forest Inventory), or there are national outdoor recreation demand inventories (Denmark, Finland, Scotland), and in some countries there are databases of recreation supply (of recreation areas, trails, other services).

Because of the lack of systematic information collection, there is an obvious need to enhance monitoring of social aspects of use of natural resources, and also other sectors such as health and wellbeing in society related to nature-based recreation and tourism. Globalisation continues to have a stronger impact on human society across Europe, and European countries will continue to share policies for use of natural resources but also in terms of the status of wellbeing of populations. Good measures and indicators for our societies' success in achieving the objectives of sustainable development are essential and valuable for the wellbeing of people. Our knowledge-base and understanding of the full range of benefits, which people gain from the natural environment when taking part in outdoor recreation, supports the overall goal of enhancing the provision of access to healthy green environments for recreation.

Our next challenge is to work for relevant and informative indicators that reveal the benefits to our societies. First, the task is to develop and improve the indicators, which are already in use, and also to create new indicators. The indicators should be effective, focused, and be useful for many purposes and also in other sectors of natural resources in North European countries and beyond. Recommendations for standardized and harmonized recreation indicators are needed. The second task is to assess what kind of recreation indicators are possible to implement, and what kind of quantitative data is available for collection on a continuous basis in different countries. There is also a need to ensure feasible monitoring systems, which are reasonable in terms of cost and methodology so that many countries can apply them. There is a challenge to develop monitoring systems to produce inventory data for recreation statistics that provide a knowledge-base for indicators that are comparable and useful in monitoring sustainable nature-based recreation across Europe.

In conclusion, the project identified a need for better indicators and development of systematic and long term monitoring of sustainability in recreational use of forests and protected areas among Northern European countries, and across Europe as a whole.

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Toward indicators of nature-based recreation in Sweden

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Nature-based recreation has received an increased attention in several national policies in Sweden recently. Driven by the implementation of a national outdoor recreation policy and the assessment of the national environmental objectives, focus has been on the possibilities to develop indicators to monitor nature-based recreation (e.g. outdoor recreation and nature-based tourism) in the different policies. This paper briefly outlines this process including proposed key dimensions of such indicators and the design of a national outdoor recreation participation survey. Such information will serve practitioners with tools to better monitor and forecast nature-based recreation and associated effects on natural, social and economic environments.

Outdoor Recreation in National Policies

In 2010 the parliament voted for the government bill "The Future of Outdoor Recreation" (Framtidens friluftsliv) providing Sweden with its first outdoor recreation policy at the national level. The parliament did also request measurable objectives to be developed for each of the ten policy areas, which were reported to the Ministry of Environment in 2012. The ten policy areas and proposed measurable objectives include:

1) Accessible nature
2) Strong commitment and cooperation
3) The Right of Public Access (Allemansrätten) forms the basis of outdoor recreation
4) Access to nature for outdoor recreation
5) Attractive natural areas close to urban centres
6) Sustainable regional growth
7) Protected areas as a resource for outdoor recreation
8) Valuable outdoor recreation at school
9) Outdoor recreation for the good health of the people
10) Good knowledge of outdoor recreation

In December 2012 the government writ 'Mål för friluftslivspolitiken' (Goals for the Outdoor Recreation Policy) was published which points out the future of the Swedish outdoor recreation policy more or less following the intentions in the above mentioned ten policy areas (Writ. 2012/13:51). During the process described above, the Swedish Environmental Protection Agency identified better statistics as one among several issues to be resolved if the objectives of the outdoor recreation policy is to be complied.

In addition to the national policy on outdoor recreation, eight out of the 16 national environmental quality objectives in Sweden also address social values in terms of outdoor recreation (for example a balanced marine environment, flourishing coastal areas and archipelagos, stainable forests, a magnificent mountain landscape, and a good built environment). Several of the objectives emphasize the importance of urban proximate environments for recreation opportunities as well as a natural environment free of noise. Other policies also including outdoor recreation are concerning forestry, protected areas and public health. Swedish forests provide many different benefits to society and the forest policy has two equal objectives – wood production and environmental protection. Social values are considered, but lack more specific objectives. Policies regarding protected areas have increasingly emphasized social values the last decades and in the early 2000 the Swedish Environmental Protection Agency launched the "Protect, Preserve, Present" program for a better utilization and management of protected areas. In the more recent proposition "Hållbart skydd av naturområden" from 2008 it is further stated that protected areas should be managed so they are accessible and a resource for regional development, tourism and public health.

Proposed Indicators

During 2013 the Swedish Environmental Protection Agency commenced a project to develop indicators for an effective follow-up of outdoor recreation in the environmental objective system in order to assess status, development and goal achievement within the eight objectives that have specifications for outdoor recreation (Naturvårdsverket, 2014). The system should be harmonized with the national outdoor recreation policy and the challenge was in finding common bases for a follow-up that can be used in both objectives' structures. Since outdoor recreation is a multifaceted phenomenon that finds expression in different contexts and results in different types of values it is important to focus on outdoor recreation in aggregate form (the practice of outdoor recreation); indirectly measuring the values of outdoor recreation with information on the natural and cultural landscapes through assessment of the landscapes' suitability, distance and accessibility; as well as collecting direct information in the form of experiences and knowledge on the part of visitors. Table 1 shows the main

dimensions of the outdoor recreation indicators proposed.

Table 1: Main dimensions of outdoor recreation indicators

1. Participation in outdoor recreation	
2. Protecting and preserving values of outdoor recreation	2a. Assessment of the landscape's suitability
	2b. Experience values
3. Accessibility	3a. Distance and approachability
	3b. Service and infrastructure
	3c. Information and knowledge
4. Noise (experiences of)	

A National Survey on Outdoor Recreation

In working with the indicators described above, several shortcomings became apparent in available statistics and data. While the number of suggestions may seem comprehensive, appropriate data does not exist to the extent needed and one mean to deal with this has been to launch a national survey on outdoor recreation participation. The survey is conducted using a national web-based panel including 12 monthly waves of 700 responses each (8 400 observations in total). Questions asked concern frequency of time spent in the outdoors, participation in outdoor recreation activities, latent demand and constraints to participation. The survey also included several questions concerning the most recent visit in the outdoors as well as measures of the attractiveness of different nature environments by an assessment of photographs from the National Inventory of the Swedish Landscape (NILS). The survey is conducted by Mid-Sweden University on behalf of the Swedish Environmental Protection Agency during 2014 and will serve as a benchmark for outdoor recreation in Sweden in the future.

Naturvårdsverket, 2014. Uppföljning av friluftsliv. Förslag till en samlad uppföljning av friluftsliv inom miljömålssystemet och friluftslivsmålen. Rapport 6480, Stockholm.

Writ. 2012/13:51. Mål för friluftspolitiken. Regeringskansliet, Stockholm.

What is "*wise use*" and "*acceptable disturbance*" of wildlife in protected areas? On balancing nature protection and recreation.

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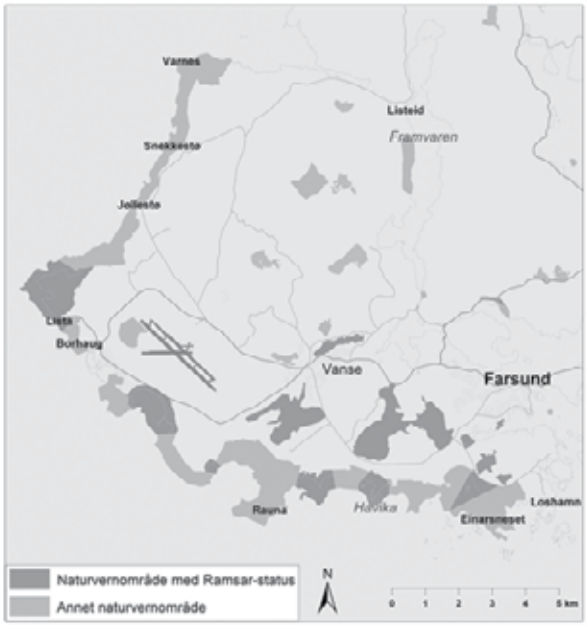
Introduction

The premise for this presentation is several examples from Norway where fauna (e.g. birds, wild rein deer), both within and outside protected areas, are (potentially) disturbed by human traffic and recreation. When should "fauna disturbance" be regarded as an ecological problem, an animal welfare challenge, a violation of the protection goals, or as acceptable? Le Corre *et al*. (2009) have reviewed international literature on bird disturbance, since they have similar challenges in protected areas along the coast of Brittany, France.

A study from the Lista seashore, at the southern point of Norway, can illustrate the issue (Vistad 2009). It concerns the balance between nature protection (primarily birds and bird habitats) and water based board sports, namely kite-boarding, sailboarding and windsurfing. There is a continuous row of protected areas along this seashore (see figure). Several of them are designated Ramsar-sites and should be managed in accordance the Ramsar-convention and the local regulations. Some of these protected areas overlap with public recreation areas, but here the traditional and land based outdoor recreation is given priority; water based board sports are mainly prohibited, even though the Lista seashores are of national importance for these board sports (due to the natural conditions). The reason is that the birdlife should be protected from disturbance, but the traditional land based activities seem to be less questioned about the disturbing effects.

A revision of the management plan for the protected Lista areas is now being prepared, and it is time to raise some principle issues and discuss challenging concepts like un-/acceptable disturbance, the precautionary principle, sustainable use of protected areas, the societal position of new/modern outdoor recreation and knowledge based management of protected areas.



The Lista area, Norway. Ramsar sites in dark green and other protected areas in light green (www.miljøstatus.no/Vest-Agder).

The Ramsar and Bio-Diversity conventions

Both the Ramsar Convention on Wetlands (1971) and the Convention on Biological Diversity (1993) elaborates the importance of combining conservation and sustainable use. The Ramsar Convention homepage (www.ramsar.org) talks about *wise use of wetlands*, defined as "*…the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development. Wise use therefore has at its heart the conservation and sustainable use of wetlands …*". So, a Ramsar site is not supposed to be protected *from* people, but shall "*promote the conservation of the wetlands…, and as far as possible the wise use of wetlands…* ". So what can be regarded as wise use? What

is good governance of protected wetlands or more generally of protected areas?

What is 'acceptable disturbance'? The management challenges.

There is great variance in how, when and why different birds and species react to an approaching human, and the actual response is influenced by several local environmental conditions. Level of habituation to human presence is an important factor (Nisbet 2000). These responses can be regarded as the birds' natural/learnt responses to what they experience as (possible) external threats. Their behaviour is quite similar to their responses towards natural enemies in their living environment, and thereby an expression of how e.g. the actual bird species naturally function and adapt. As a management strategy this *ecological function based approach* therefore can accept some human disturbances, but is also based on the premise that the actual individuals/stocks must be in a good health condition and fill their natural function in their natural environment (e.g. Arlinghaus *et al*. 2007).

It is the behavioural response of the individual bird or the present flock that can be directly studied, and Le Corre *et al*. (2009) show that these short term effects dominate the literature, and not the more important long term impacts on the populations. Consequences from disturbance on the population or species level are not easily observed, but this is the relevant and important scale level when we are focusing on "*the maintenance of their* (the wetlands) *ecological character*…" (the Ramsar Convention), seeing the actual *vulnerability* of the stock/species as the important factor.

What is relevant knowledge?

Good and respected management decisions must be based on relevant and trusted knowledge. In a case like Lista, the studies of the actual response among individual birds or flocks of birds are not sufficient. The important level is the ecological function of these birds' living environment, and a possible cumulative human impact assessment (Le Corre *et al*., 2009; Therivel & Ross, 2007). The Lista project also shows the relevance of detailed knowledge about the spectrum of human and recreational activities. As Le Corre *et al*. (2009) state: The specialized coastal activities are most focused on the management, but may be the dominating (and at Lista: accepted) activities, like walking with/without a dog are actually more disturbing for the birds?

The potential for combining both bird protection and (acceptable) recreational activities lies in this combination of relevant ecological knowledge, and knowledge about human activities and various site conditions. Le Corre *et al*. (2009) ask for more interdisciplinary research. The present strict management regime has mainly been based on the precautionary principle, with frustration, lack of trust and low legitimacy as a result (Dommelen, 2000).

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SESSION 4A BALANCING LOCAL COMMUNITY INTEREST AND TOURISM DEVELOPMENT

Identifying community values to inform park management: an application of PPGIS.

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Protected areas provide a wide range of ecological, socio-cultural and economic values. While much work has been dedicated to ecological and economic valuation, there has been little systematic research to assess the social and cultural values attributable to protected areas. These less tangible values of protected areas are considered to be undervalued despite suggestions they are likely very important to the general public (Harmon & Putney, 2003). While it can be difficult, developing an understanding of community values of protected areas can be useful in guiding park management planning and decision-making. This study was undertaken to provide public input to assist the local management agency, Parks Victoria, in better understanding the landscape values and management preferences of the community in relation to protected areas. Landscape values are perceptions about places that determine land use aspirations and conflict. When landscape values are scientifically identified and mapped, they provide for a wide range of land use suitability and social impact analyses.

This study used an online public participation GIS survey (PPGIS) to evaluate the values people attributed to the protected areas and other public lands in the state of Victoria, in southeastern Australia. Victoria is the most densely populated state in Australia and the second most populous overall. It covers an area of 227,416 square kilometers, of which 31.8% comprise public lands – predominately parks and reserves (34.3%) and forest reserves (35.9%). In order to explore the community values and management preferences for protected areas, a Google Maps application was used to collect data from December 2013 through January 2014. The application allowed for navigation across the entire state and instructed participants to place markers identifying the location of specific public land values such as recreation, aesthetic, and biological value, as well as preferences for future land management (e.g. increased tourism development, increased conservation protection, additional recreation access and improved fire protection). The online method employed a number of navigational short cuts for mapping the location of values and preferences. The study also included a 14-question survey that followed the mapping activity and addressed participant and visit characteristics. Participants were recruited on-site at different national park locations and through a mix of other sources including distribution to national park advocacy groups, radio talk shows, and the use of social media. A variety of incentives were offered for participation in the study.

The study recruitment approach was very successful with over 1,905 respondents participating in the study. Responses identified as from various recreational groups and environmental advocacy groups made up for 20% of the total respectively. Over 35,347 point locations were identified within an 8-week period, making this study one of the largest scale PPGIS studies to date. The mapping effort of respondents was good, with an average of 18.8 mapped markers per participant. The largest number of locations mapped was 426.

The most frequently mapped values were recreation (n=5,939/20% of all markers), scenic/aesthetic (4,904/16%), biological (3,397/11%), life sustaining (2,051/7%), and wilderness (2,030/7%). The least frequently mapped values were economic (644/2%), spiritual (845/3%), and therapeutic (1197/4%). The mapping of management preferences totalled 4,446 markers or about 15% of all markers mapped. The most frequently mapped preferences were to prohibit future development and/or land use change (1439/32%), to increase conservation and protection (1277/29%), and to improve vehicle access (415/9%). The least frequently mapped preferences were to increase extractive activities (e.g., mining, logging) (57/1%), to increase resource use (e.g., grazing) 105 (2%), and to increase tourism development (118/3%). Other management preferences mapped were to improve bushfire protection (390/9%), add recreation facilities (308/7%), and decrease or limit vehicle access (234/5%).

Social landscape metrics were calculated for all parks and reserves containing 30 or more mapped values (n=93). Social landscape metrics give a better understanding of the structure and distribution of common and unique values across the park/reserve system (Brown and Reed 2012) and identify distinctive or unusual value distributions that can provide a focal point for managerial attention. The two metrics that measure the frequency of mapped values indicate that four national

parks in particular—Alpine, Wilsons Promontory, Grampians, and Great Otway—are most important to residents of Victoria. These four national parks were mapped more than twice as often as any other park/reserve in Victoria. In terms of visitor numbers, these parks are among the most popular of Victoria's National Parks and appear deserving of the title of the "People's Choice Award" for Victoria's most valuable national parks.

Overall this study found that the protected area estate in Victoria provides the full spectrum of social and cultural ecosystem values with recreation, scenic/aesthetic, and biological values being most recognized by study participants. The larger, most highly visited national parks appear disproportionately important in providing these values, but the social landscape metrics also reveal that on a per hectare basis, metro and regional parks provide higher intensities of values centred on recreation. Despite the uneven spatial distribution of protected areas within Victoria, these lands comprise a complementary and representative system of social and cultural values that are abundant, rich, and diverse. National and wilderness parks provide relatively pristine natural settings that are differentially important for wilderness and intrinsic/extrinsic values, state forests provide biological and life sustaining values combined with nature-based recreation, and metropolitan and regional parks provide important recreation opportunities proximate to urban and suburban populations. The Victorian coast further augments the system by providing exceptional scenic values in combination with abundant marine life.

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Local awareness, acceptance and tourism development: challenges and opportunities for protected area management in Post-Soviet countries – the Samur-Yalama National Park, Azerbaijan

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Introduction

'Park-people relationships' is a focus of researchers since the 1980s, notably the role of protected areas (PAs) as components of regional economies and their potential to provide income to local communities, through, for example, nature-based tourism (Arnegger, 2014). Conversely, PAs are likely to face opposition if local communities are not adequately compensated for use restrictions (Mayer, 2014).

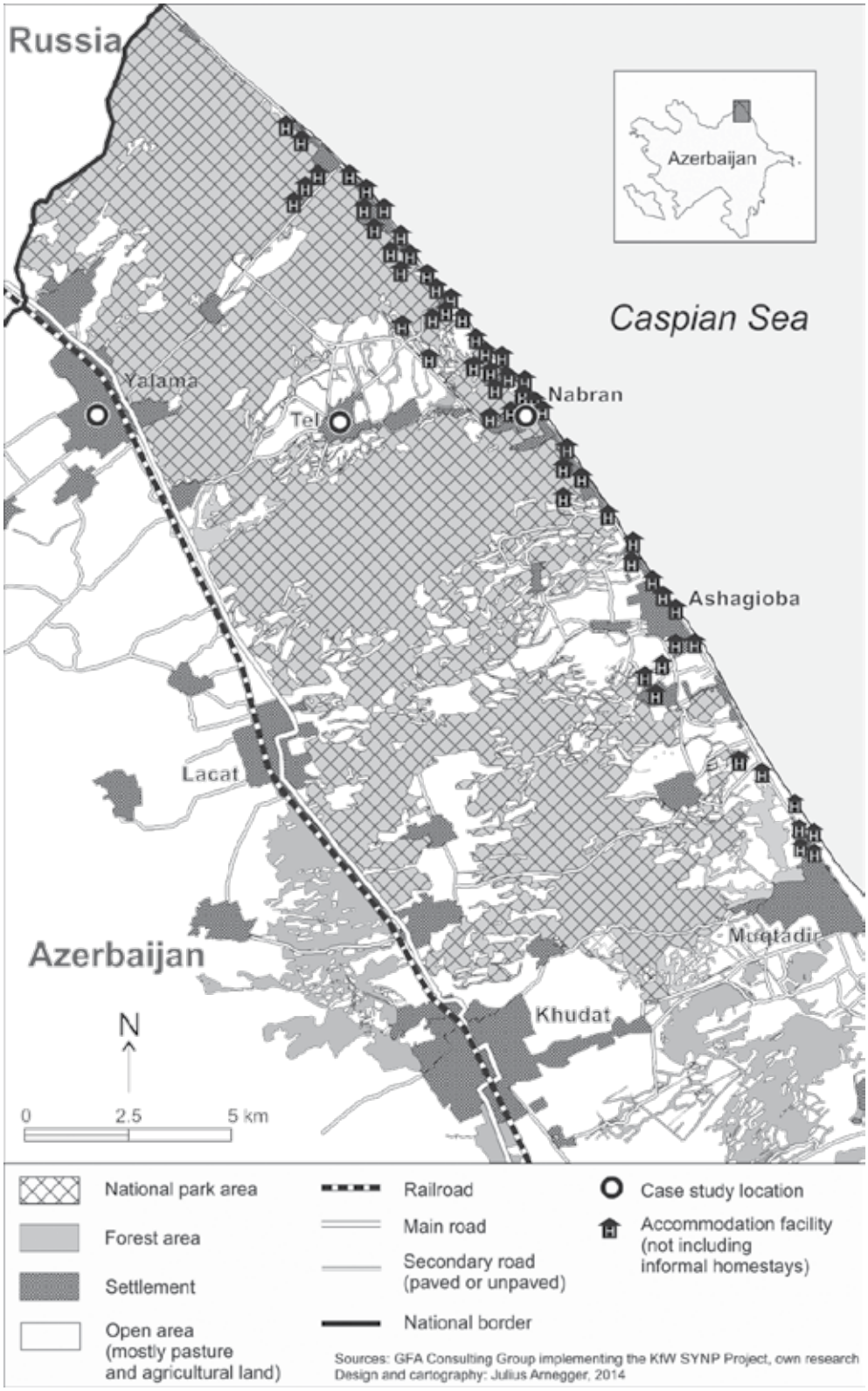
The adoption of integrative management approaches arguably pose specific challenges to post-opSoviet countries, where PA systems were not exempt from the general dramatic economic and political changes since the late 1980s (Müller, 2014). This study focuses on local awareness of, and attitudes towards, a newly-established national park in Azerbaijan, and evaluates challenges and opportunities for regional economic development.

Context: Azerbaijan's PA system and Samur-Yalama National Park (SYNP)

Azerbaijan and the Caucasus region at large are considered as a global biodiversity hotspot (Schmidt and Uppenbrink, 2009). Azerbaijan's PA system dates back to Soviet times, but all of its nine national parks were established since 2003 as part of a new, ambitious PA program. Challenges for Azerbaijan's PAs include underfunding, lack of research and monitoring, and a low degree of public awareness for environmental issues (USAID Caucasus, 2010). The latter is aggravated by insufficient inclusion of the local population in decision-making processes in which, comparable to Soviet times, top-down approaches prevail.

SYNP was established in 2012 with support from the German Development Bank (KfW) and international consultants (MENR, *et al.*, 2014). The park covers 11,772 hectares of the last remaining coastal forests in the country (Schmidt and Uppenbrink, 2009). It is located on the Caspian shore, south of the Russian border. The forest areas are fragmented and interspersed with settlements and pasture plots of different sizes. The latter, as well as the coastline which has been used for tourism purposes since Soviet times, are excluded from the park (cf. Figure 1). Parcels on the coast are increasingly occupied by tourism infrastructure and second homes, often in ecologically sensitive locations. Although the development of park-related sustainable tourism products is planned, so far, both demand and supply focus on conventional (mass) beach tourism. SYNP's outline and location thus imply potential land-use conflicts between conservation, agriculture and tourism.

Three case study locations (cf. Figure 1) were selected so as to represent existing intraregional differences: decreasing tourism intensity from coast to hinterland, and decreasing access to major transport and trade routes from the hinterland to the coast: (1) The small beach resort town *Nabran* (ca. 620 inhabitants) is a popular destination for domestic tourism. It accounts for 3,000 hotel beds and an unknown number of private homestays. (2) *Tel* (ca. 500 inhabitants) is situated in the central area of SYNP. Although close (3 km) to Nabran, Tel is rarely visited by tourists and economically disadvantaged due to a lack of infrastructure and its location off the main road and beach. (3) *Yalama* has about 3,600 inhabitants. Here, border traffic on the road to Russia has a marked influence on the local economy.
Figure 1: Map of SYNP



Methods

In August 2012 and December 2013, 30 semi-structured interviews on socioeconomic conditions and development as well as acceptance of and attitudes towards SYNP were conducted with local residents in Nabran, Tel and Yalama, and with representatives of public authorities. The latter included managerial staff from the SYNP administration and municipalities. Local residents were selected so as to represent typical socioeconomic situations in the three villages and the region at large with regard to employment status, degree of involvement in tourism, existing work-relation to SYNP, etc. Interviews typically lasted between 20 and 60 minutes; they were recorded and later transcribed.

Results

To date, knowledge of SYNP among the local population remains diffuse. Different patterns of awareness, attitudes and potential land-use conflicts emerge in the three case study locations that reflect the socioeconomic disparities outlined above.

Respondents in *Yalama* are mostly unaware of and indifferent to SYNP. In this settlement, the local economy is, besides the omnipresent subsistence farming, based on trade and border traffic and much less dependent on natural resources than in Nabran and Tel, where tourism and agriculture prevail.

In *Nabran* and *Tel*, most respondents link a positive view of the national park to hopes for a speedy connection to the public gas distribution system. Due to high market prices for firewood, poorer households, notably in Tel, appear to still rely on illegally collecting firewood in the forests of SYNP, and using the latter as pasture for livestock. Thus, pressure on natural resources persists.

Expectations related to tourism development in SYNP are voiced from the local population and public authorities in *Nabran*. However, concerns are raised with regard to ecological stress from increased visitation e.g. solid waste pollution.

In *Tel*, most respondents claim to view SYNP positively at first, but deeper questioning reveals more ambiguous attitudes: compensations for use-restrictions on natural resources (or lack thereof) are an issue of concern for the rural poor. In addition, it is questionable whether the establishment of SYNP will significantly mitigate unemployment, the overarching problem in Tel.

Discussion and conclusion

Without adequate compensation and participation, nature conservation in Azerbaijan is likely to be at odds with the socioeconomic needs of poor peripheral communities. The latter require more attention by PA managers in order to minimize deviant behavior such as clandestine grazing or the collection of firewood. In the short-term, establishing a gas supply will alleviate financial stress for poor households, but developing national park-related tourism offers also needs to be considered, so as to achieve a more balanced regional distribution of income, and, ultimately, local support of SYNP's conservation goals.

SYNP´s location in proximity to a popular beach destination holds the potential of a diversification of tourism products. However, careful planning and management are necessary in order to make tourism a driver of sustainable regional development. Finally, it also appears important not to raise unrealistic economic expectations related to SYNP: in the short-term, a significant increase in visitor numbers is questionable given the marginal role that ecotourism is currently playing in Azerbaijan.

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National perceptions on protected areas and local community involvement in the Swedish mountains

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Annika Dahlberg, Stockholm University, Sweden

Background

The establishment of protected areas, and how they should be managed, is often perceived differently by national conservation authorities and varied local interests respectively, and tension, mistrust and even conflict are not uncommon. The causes for this may vary between areas, due to context-dependent factors such as historical legacies, existing land use, and the degree of actual or perceived top-down approach (Adams & Jeanrenaud, 2008). The present study aims to relate interests and perceptions as formulated by local interests and government authorities to those expressed by the general public, with a focus on the latter.

The official rationale for establishing national parks includes statements about their national importance as tourist attractions and their iconic values as well as the importance to protect perceived wilderness from human interference – other than tourism and research. Most of the Swedish mountains are by many actors described as wilderness areas with pristine nature suitable for recreation and nature-based tourism. Protected areas in Sweden are generally designated and managed through centralized decision-making, and can be described as the result of outsiders' agendas and interests. Nowhere else in Sweden are official nature conservation and tourism interested such powerful stakeholders as in the mountain region (Wall-Reinius, 2012).

In the last decade new ideas concerning the role and management of protected areas have gained increased interest internationally (Adams & Jeanrenaud, 2008). Here local participation in the designation process and management, including respect for local interests and knowledge, are important components. In 2004, the Swedish EPA launched a program concerning protected areas which focused on local participation and management planning, outdoor recreation, tourism, visitor information, monitoring and evaluation (Naturvårdsverket, 2004). This indicates a potential shift from the traditional top-down perspective towards an engagement with local interests and regional development, where nature-based tourism is perceived as a key issue. In addition, at a global scale there is an increased recognition that management of natural and cultural resources should be approached from an integrated landscape perspective and in close collaboration between national and local authorities, private organizations and the public to improve planning and management (i.e. the European Landscape Convention). This could (or should) have important implications also for the management of protected areas. In addition, present trends could also entail a shift from areas managed solely for their natural and/or outdoor recreation values to areas managed for their working landscape values (Laven *et al.*, 2014).

Findings

In this study, views and experiences held by the general public in relation to conservation, protected areas and local land use and interests are examined. In a national study conducted in 2013, 1000 respondents in a web-panel survey among the Swedish population were asked about their perceptions, associations and values in relation to the Swedish mountain landscapes. Other questions concerned their opinions regarding the establishment and management of protected areas, including the role of local communities.

This paper will present findings primarily from the national survey, which will tentatively be related to preliminary results from interviews with different stakeholders concerned specifically with the mountain landscapes in Jämtland County. Preliminary findings indicate that the general public are positive towards protected areas in the mountains. According to these respondents, it is important that protected areas are established for the preservation of nature, including protection of threatened species and ecosystems, and to preserve nature untouched by humans. Furthermore, for the respondents it is important that protected areas are accessible for visitors and enhance outdoor recreation opportunities. Respondents are also positive to the suggestion that the local population should have great influence on protected area establishment. According to the respondents, management decisions should be made locally and regionally. More than one third of the respondents have experienced conflicts of interests in relation to the use and management of protected areas.

Discussion

In Sweden, numerous examples of conflict still remain in relation to protected areas, despite new trends concerning their function and management. A central reason for conflict is the failure to acknowledge the importance of how socially constructed images of landscapes, i.e. perceptions of a particular landscape or particular types of landscapes, influence opinions and actions (Dahlberg, 2014). This may result in conflicts between different stakeholder groups whose perceptions

and images of a specific landscape differ, for example in protected areas within multifunctional landscapes.

The results from the national survey illustrate how new trends in conservation only partly have become accessible and/or accepted, and thus how multiple ideologies simultaneously influence perceptions concerning the value and use of landscapes. The mountains are still seen as pristine and untouched, in spite of the evidence that they are cultural landscapes where multiple actors access and use various resources. On the other hand, survey-respondents were clearly in favour of increased local influence in the establishment and management of protected areas. Clearly these views are not compatible, and they indicate a risk for further conflicts between national and local/regional interests. Similar – and additional – ambiguities concerning the understanding, perception and valuation of the mountain landscapes were found also in the qualitative interviews with local, regional and national stakeholders.

The present study aims to shed light on the different and sometime conflicting views and ambitions held by different interest-groups as well as the partly contradictory perceptions maintained within groups. Conflicts, for example over landscape values, access, types of use, as well as practical management, can only be resolved in a sustainable manner if different interest groups are aware of the views and needs of others. We aim to contribute to the debate concerning conservation interests and landscape management, and hope that our results can constructively influence policy and planning concerning conservation and protected areas in relation to the potential emergence of more holistic landscape discourses in which informed local interests can be expected to have a more prominent role.

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Future tourism development in a vulnerable natural area: the case of the Dutch Waddencoast. Stakeholder perceptions on tourism development

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The Waddensea area, which is spread along the sea and the coast of The Netherlands, Germany and Denmark, holds very unique natural values. The Dutch waddencoast is a rural area, which has less employment and less social services than the waddenislands or other parts of the country. Many young people leave the area and buildings stay empty. Only 8,5 % of overall employment at this coast is comprised of tourism and research shows that the area has a very limited attractivity of its natural resources (Sijtsma, Daams, Farjon & Buijs, 2012). At the same time the UNESCO status of the Waddensea (which was awarded in 2009) gives new opportunities for tourism development along the coastal area. The research group Marine Wetland Studies of Stenden University Leeuwarden has studied the perceptions of different stakeholders with regard to the future tourism development of the Dutch Wadden coast. Different stakeholders in The Netherlands and Germany were asked about their future visions. Besides this, the research group has contributed to two promising projects in which the local community tries to transform empty buildings into small-scale tourism facilities.

Perceptions of stakeholders

Future visions

None of the Dutch respondents thinks that the nature on the Dutch Waddencoast will be harmed by tourism developments. Nature organizations think that allowing visitors in a natural area will create awareness and appreciation for the nature, which is agreed upon by Postma, Yeoman and Oskam (2013). These organizations are willing to cooperate with tourism entrepreneurs. Dutch governmental bodies see the necessity of a bottom up approach. In Germany a more top down approach is being used when it comes to tourism development. Organizations in Germany are less likely to allow visitors in protected areas. This can be regarded as a more vital perspective on nature in which preservation, restoration and development of biodiversity is important (PBL, 2012).

The German Wadden coast is much more developed than the Dutch coast. In Germany, the coastal towns are bigger and more modern accommodations are established. Also signposting, marketing and communication are much more developed and abundant. A tourist can choose between many different companies, which offer the same product.

The vision of the entrepreneurs in The Netherlands is mainly focused on improving the economic situation. Especially in the cities of Harlingen, Den Helder and Delfzijl the entrepreneurs have large ambitions, also compared to the entrepreneurs in the more rural areas.
The City of Harlingen sees possibilities for kitesurfing and cruise tourism. Delfzijl wishes to develop a ferry line to the German island of Borkum. The Waddencoast lacks beaches; according to the interviewees this is the reason why it is not as developed as the western coast of The Netherlands.

Local and regional governmental bodies want to focus on an extension of the season and development of hiking and biking trails. Visitors should enter the area via gateways, which allow larger visitor number and larger developments. Outside the gateways only small scale developments are allowed. In this way vulnerable areas are protected from overuse. The region should make use of its own qualities and should not try to resemble the products of popular tourism destinations. High quality and low impact tourism can be developed by making use of existing facilities such as empty houses, community centres or churches.

Local development of Tourism Products; 2 case studies

The Dutch coastal hiking trail is a long distance hiking trail of 725 kilometres. It starts in the South-west Province of Zeeland and follows the Dutch coast all the way to the North to the Waddensea coast. Although the trail is well developed in terms of signposting and a route description, there is not enough tourism accommodation to cater to larger numbers of visitors. The empty houses provide opportunities for new accommodations. A group of 3 local entrepreneurs wants to establish a cooperative in order to transform these houses into tourism accommodation for hikers. Each house owner (private owners or housing cooperations) will bring in a house into the cooperation. The local society is involved by offering transport of luggage, food, beverages and entertainment. Connections are made with entrepreneurs such as the bakery, restaurants and tourism attractions. The Cooperation takes care of the renovation and maintenance of the houses but also of the marketing and booking system.

In the village of Holwerd, which is nearby the ferry to one of the islands, an empty church will be transformed into a visitor centre. A group of inhabitants have taken the initiative to develop the church into a centre for visitors with a museum. Several studies realized by the research group give insight in the feasibility of a touristic function for the old church; the connection between the village, the dike and the Waddensea gives opportunities for the development of small-scale tourism products.

The local community benefits from these developments in the sense that it generates direct revenue and improves the level of facilities and social cohesion in the area. Both projects are in line with one of the strategic goals in the Waddensea tourism Strategy 2014, which wants "to ensure stakeholders have responsibility for and contribute to the protection of Outstanding Universal Value through involvement in tourism management and product development" (Common Waddensea Secretariat, 2013).

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SESSION 4B MONITORING AND MANAGEMENT OF MOUNTAIN BIKING

How formal and informal mountain biking trails result in the reduction, degradation and fragmentation of endangered urban forest remnants

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Introduction

Forests provide important settings for a diversity of recreational activities, including urban forests. Where there are remnants of natural forest in urban areas, they often become hotspots for recreational use, including mountain biking. As a result, extensive networks of formal and informal trails can develop, causing an array of negative environmental impacts. Despite extensive research on trail impacts in forests, there is comparatively less research that compares the impacts of formal (management-designated) and informal (visitor-created) trails in terms of their effects on reducing, degrading and fragmenting multiple forest remnants. We compared the relative impacts of formal and informal mountain bike trails in remnants of an endangered urban forest, Tall Open Blackbutt Forest.

Study Region

This high conservation ecosystem exists as a highly fragmented network of isolated remnants spread over 937km2 along the rapidly urbanising lowland corridor linking the cities of Brisbane and Gold Coast in coastal Queensland, eastern Australia. Over 80% of this forest has been cleared since European settlement, with only 2,024ha remaining as small isolated patches often surrounded by urban residences. As a result, these forest remnants are popular destinations for mountain bikers due to their proximity to urban populations and varied topography (Pickering *et al.*, 2010).

Methods

We mapped the total area and all types of trails, including formal and informal mountain bike trails, within 17 publically-accessible forest remnants (829ha total) using a method similar to the condition class assessment. To assess the amount of forest lost to the trails including different structural components, we measured the maximum width, depth and slope of the trail and the distance from trail edges to the litter layer, understorey, midstorey and trees at 80 random sampling points; 40 each on formal and 40 on informal trails. We used a buffer analysis in ArcMap 10.1 to calculate the loss of the different structural components of the forest and ANOVA to assess differences in loss between formal and informal trails. To measure how the forest along trail edges has been degraded, we measured tree density, percentage canopy cover, litter depth and percentage of sapling, mid age, mature and dead trees adjacent to either side of the track at each of the points using 50m x 5m transects parallel to the trail, and at 20 random points within the forests (controls). To compare fragmentation between 5 remnants dominated by formal or informal trails (> 90% trails of either type), we calculated fragmentation indices for the 10 remnants as Weighted Mean Patch Index (WMPI) and Largest 5 Patches Index (L5PI) of Leung and Louie (2008) and then compared remnants using ANOVA.

Results

Mountain biking occurs on nearly all (95%) of the 46.1km of trails in these forest remnants, although 45% are also used for hiking. Most of the trails were informal (bare earth, 32.1km, 74%), while formal trails (all hardened) accounted for the rest. The maximum width did not differ between formal and informal trails, however soil loss was greater on informal trails which were also often on much steeper slopes (Table 1).

Mountain biking trails resulted in the loss of 47.2ha (5.7%) of forest with 17.1ha lost to the trails themselves, plus an additional 0.9ha of litter layer lost, 5.8ha of understorey, 18ha of midstorey and 30.1ha of trees along the trail edges. Due to the greater length of informal mountain biking trails, they accounted for 65% of the area lost. Per unit area of trail, however, there were no differences between the impact of formal and informal trails on the loss of each of the different structural components of the forest (Table 1).

The impacts of the trails extended into the forest along trail edges, with reduced canopy cover and fewer mature trees but more saplings compared to intact forest. There were also differences between the trail types with more saplings and fewer mature trees along the edge of formal trails compared to informal trails, but no differences in tree density, litter depth or percentage of mid and dead trees (Table 1).

Fragmentation as measured by WMPI was greater in forest remnants dominated by informal trails. However, there were no differences in fragmentation according to the L5PI index (Table 1).

Conclusions

This study found that formal and informal mountain bike trails can differ in how they reduce, degrade and fragment urban forest remnants. These differences were, in part, a result of the much greater spatial proliferation, and therefore, fragmentation capacity of informal trails that formed dense, geometrically-complex networks that cumulatively resulted in a greater loss of forest than formal trails. We found remnants with numerous informal trails tended to be small (< 10ha), in more highly urbanised areas, had no legal protection and had numerous entry points, all of which likely contribute to high densities of informal trails. Such remnants likely experience a disproportionately large reduction in the undisturbed area of natural forest and, therefore, the habitat available to many disturbance-sensitive species. The level of fragmentation by informal trails was similar to that caused by local urban development (Ballantyne *et al.*, in review) as well as intense trail use in popular USA national parks (Leung *et al.*, 2011).

Interestingly however, in contrast, there was actually more degradation of remaining forest vegetation along the edges of formal trials with more saplings and fewer mature trees. These effects are likely related to the way such trails are constructed and maintained resulting in more initial damage to the forest, and hence early successional stage regeneration along forest edges. As such, these trails may have stronger per unit area effects on the structural integrity, and therefore biodiversity of these forests (Wolf *et al.*, 2013). Based on these relative impacts, we suggest that the use of narrow, unhardened formal trails with appropriate slope alignment be combined with methods to reduce the proliferation of informal trails such as trail-bordering to stop widening and centralising visitor flow. These management actions may help alleviate some of the threats mountain biking can pose to urban forest remnants.

Table 1: Means and standard deviations of trail variables, loss of forest structural components, vegetation degradation variables and fragmentation indices. Bold-values are those with significant differences at $p < 0.05$ with letters signifying post hoc differences. WMPI = Weighted Mean Patch Index, L5PI = Largest 5 Patches Index (Leung and Louie, 2008).

Variable	Formal (± SD)	Informal (± SD)	Control (± SD)
Length (km)	11.9	32.1	
Width (m)	2.8 ± 0.8	2.9 ± 1.8	
Soil loss (cm^2)	463.5 ± 411.9	2,486.9 ± 3,358.5	
Slope (°)	4.7 ± 2.5	7.4 ± 6.7	
Distance to (cm)			
Litter layer	10.6 ± 16.4	11.7 ± 19.3	
Understorey layer	77.2 ± 51.1	62.6 ± 36.7	
Midstorey layer	234.6 ± 86.5	224.9 ± 102.5	
Tree layer	406.7 ± 127.4	381.7 ± 154.9	
WMPI	1.2 ± 0.2	0.6 ± 0.3	
L5PI	97.9 ± 1.4	81.8 ± 18.8	
Tree density (trees m^{-2})	0.32 ± 0.24	0.31 ± 0.18	0.38 ± 0.20
% canopy cover	55.3 ± 16.2a	56.9 ± 20.0a	72.7 ± 11.3b
Litter depth (cm)	4.4 ± 1.4	4.8 ± 1.9	4.6 ± 1.2
% saplings	42.5 ± 19.1a	33.9 ± 15.1b	10.7± 10.4c
% mid	40.5 ± 19.2	34.2 ± 15.8	39.3 ± 9.6
% mature	16.9 ± 9.9a	31.9 ± 15.2b	49.7 ± 8.9c
% dead	16.1 ± 11.9	14.8 ± 10.9	19.8 ± 11.5

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Monitoring and management of mountain biking through public participation geographic information systems

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Introduction

Many protected areas worldwide have a dual statutory mandate both to provide for visitor enjoyment and for the conservation of natural and cultural heritage. Furnishing quality recreation experiences is essential for national parks and other public green spaces to convey the benefits of visiting parks to the community and to build a constituency for their protection. Mountain biking for example has become an increasingly popular activity in national parks in Australia and elsewhere in the world. A range of benefits can accrue from mountain biking such as individual health and well-being, increased social cohesion and a stronger connection with the natural environment and specific places within parks. However, associated with this activity are also numerous social and environmental issues. Thus park management needs to monitor mountain biking to improve existing experiences or lack thereof while minimising potential impacts.

Participatory planning of public lands is a relatively new development in visitor experience management of parks and other protected areas. In this study we used public participation geographic information system (PPGIS) mapping (Brown and Weber, 2011) combined with questionnaire-based surveying to monitor distributions, needs and certain impacts of mountain bikers in selected national parks and surrounding land tenures in Northern Sydney, Australia.

Methods

PPGIS mapping was performed online via an internet-based map (Fig. 1a-b) and in the field along visitor tracks via a paper-based map, accompanied by a questionnaire-based survey. We addressed three fundamental and spatially implicit management questions that inform both visitor activity development and management: (1) What are the distributions of mountain biking activities and their underlying reasons; (2) What location-specific actions are required to improve existing experiences; (3) How can track infrastructure be shared between different activity groups and what are the potential social conflicts.

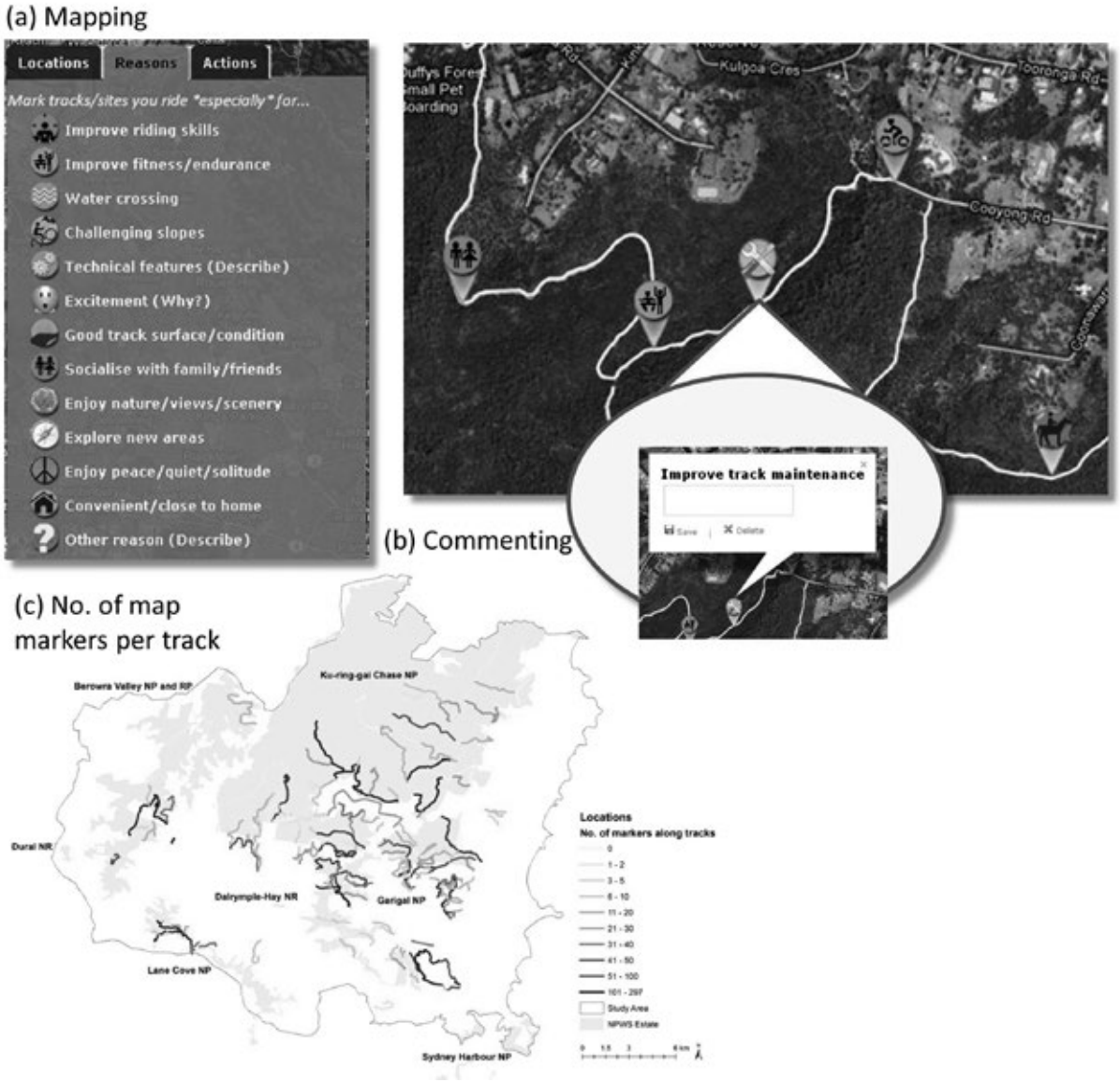

Fig. 1 Internet-based public participation geographic information system (PPGIS) to (a) map and (b) comment on locations, reasons and required actions for mountain biking experiences in northern Sydney. (c) Exemplary map showing number of location markers that were placed by participants along specific tracks within northern Sydney, illustrating visitor distributions.

Preliminary Results

(Re. management question 1) PPGIS enabled us to construct detailed maps and tables of distributions and underlying reasons for mountain biking in Northern Sydney. Fig. 1c illustrates how distributions of mountain bikers can be visualised via ArcGIS maps. Locations of rides correlated strongly with numerous motivations to ride, as inferred from the number of location and reason (motivation) markers placed along specific tracks frequented by mountain bikers within northern Sydney. The strength of the correlation though depended upon whether motivations were mapped inside or outside of parks. For example, for mountain bikers riding outside of parks was strongly driven by the desire to improve riding skills, explore new areas, to experience technical features, excitement, challenging slopes, and because of the convenience and closeness to home. These correlations were much weaker inside parks. Several motivations however were similarly important inside and outside of parks, including the desire to improve fitness/endurance, socialise with family/friends, enjoy nature/views/scenery, good track surface/conditions, and peace/quiet/solitude.

(Re. management question 2) The most requested actions included opening up tracks for riding, adding linkages between tracks, track maintenance, provision of improved signage and better track design. Detailed distribution maps and tables of these and other actions were constructed based on the PPGIS data, and complemented through findings from the questionnaire-based survey.

(Re. management question 3) We identified areas of overlap of usage by mountain bikers and other visitor groups, and

discovered evidence that conflicts (or 'misunderstandings') may arise in specific locations. A greater proportion of advanced and expert mountain bikers compared to beginners or intermediate bikers experienced conflicts. These occurred primarily with motocross/trail bike riders, dog owners and walkers, and to a lesser extent with horse riders and other mountain bikers. Conflicts were almost exclusively based on verbal confrontation or near collision (vs. physical or collision). Commenting on conflicts in the survey was more extensive than the placing of markers via the PPGIS, which may indicate that conflicts are less track-specific than for example requests for track maintenance. The PPGIS made it evident though that conflicts were restricted to areas of overlapping usage, usually only a few tracks, and that conflicts with horse riders were clearly more common within national parks (approx. 70%) whilst conflicts with walkers and other mountain bikers were more common outside of national parks. Open-ended survey comments suggested that some mountain bikers perceived motocross riders as rude, thought that they accessed tracks illegally and caused considerable damage to tracks. Some mountain bikers thought that dog owners needed to be more aware of using a leash on their dogs, in particular as they had experienced dog attacks. At times walkers were thought to be an obstacle to tracks, and misinformed in regards to the use of tracks (e.g., where mountain biking is allowed). Solutions to conflicts were seen in the provision of separate user-specific single tracks, signage to inform about other visitor groups, and the distribution of information identifying needs, safety issues and priorities of different visitor groups.

Conclusions

This research demonstrated that PPGIS mapping is a useful tool to facilitate spatial decision making in national park planning for mountain biking. Data on visitor distributions and requested actions are fundamental for improving visitor experiences in parks and adjacent land tenures. They are further important to manage social conflicts, and can be used for a variety of other purposes such as to ascertain the linkage between park usage and impacts on infrastructure and the environment.

We found limitations and future potential for the application of PPGIS, and the need to combine PPGIS with a survey component to collect participant information and other data that are not or less spatially implicit. Validating PPGIS mapping data that inform about reported park visitation with complimentary techniques such as GPS tracking that inform about actual visitation (Wolf *et al.*, 2012) are currently being explored. Overall, PPGIS offers significant opportunities for park agencies beyond their traditional visitor monitoring techniques in order to engage the public in a productive way to collect large amount of location-specific data. Findings assist in prioritising future visitor management actions across multiple land tenures and facilitate integration of public stakeholders and local knowledge held by the community in park planning processes.

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Comparing Webshare services to assess MTB use in protected areas

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Introduction

Natural parks are the majority of protected areas in Portugal, since most areas with high conservation value have resident populations. Like in other countries, the number of users seeking these territories for recreational activities is growing, but monitor and management resources are limited. With no reliable monitoring schemes, the construction of the Nature Sports Chart (CDN), which is a legal document that determines which sports activity can be done, where and when in each park, has proven to be difficult. In those 2 parks for which it has been done, recourses are not enough to make sure users comply with it, leading to several management and user conflicts.

One of the growing activities is mountain biking (MTB) that leads to two major types of impacts: environmental (e.g. biodiversity and biomass losses, soil compaction, etc. (Marion e Wimpey 2007) and social, e.g. safety (Cesseford 2003), trespassing, among others.

The increasing use of webshare services provided Nogueira Mendes *et al*. (2012) with a method that proved to be promising when tested as a way to monitor MTB in Arrábida, Portugal, without the need for many resources. This study, intends to test the applicability of this same method to the Sintra-Cascais Natural Park (PNSC), using and testing the results from other webshare services.

Study area

The PNSC (with 14 583 ha), created in 1994 has the highest resident density of protected areas in Portugal due to its location within Lisbon metropolitan area. It has a wide variety of ecosystems, some of them with high value, included in Natura 2000 Network. The CDN of the PNSC published in 2008, which is being revised, currently offers 7 trails for mountain biking. Despite the CDN, all involved stakeholders (park managers and local authorities, mountain bikers, dwellers and other users) understand that the reality of what happens with MTB in this park is quite different. They report a number of conflicts, including illegal tracks and trespassing, mostly related to the excessive behaviours of some users, that requires immediate action.

Methods

Two webshare services were chosen to systematically download all the tracks uploaded by PNSC mountain bikers using global positioning system (GPS). This allowed the comparison between the results given by each website and to assess their complementation. One is GPSies, which being the first one to be available in Portugal has the highest number of users. The second one is Wikiloc, which is more recent and with less functionalities. On both sites MTB was the activity targeted among all the existing ones.

In GPSies, queries with a five km of search radius were made to ten localities distributed all along the park to ensure that all submitted tracks were downloaded. In Wikiloc, only four localities were chosen, since it was enough to find all tracks uploaded for the study area. Due to the differences between GPSies and Wikiloc available data a comparison was made only for the searches done on the villages of Sintra and Cascais (the municipalities main centres).

The tracks were downloaded in two formats: ".gpx" associated with the tracks topology and ".kml" that includes several attributes (e.g. user and track name, total distance, total climbing, etc.) for later analysis.

All downloaded tracks were converted into shape-files using GIS software that allowed the elimination of duplicate results for each dataset. Final results were then plotted against the PNSC limits and the park zonation plan, allowing understanding the extension of the network of trails used for MTB in PNSC, and detecting management conflicts. Both datasets were compared (using the raster calculator in ArcGIS 10.2) through a fishnet grid of 50x50 m allowing to quantify the use of MTB in the study area by the number of tracks that crosses each grid.

Results

A total of 1 998 tracks were obtained from GPSies, for the study area, representing a total of 52 350.74 km, with an average of 41.88 km per track.

The comparison between GPSies and Wikiloc for Sintra and Cascais villages has shown that GPSies has many more tracks uploaded than Wikiloc (417 vs 214), which translates in a much higher number of km (17 676,41 vs 8 467,10). Even so, the mean distance per track is very close for both webshare services (42.39 km vs 39,57 km) and in line with the entire GPSies dataset.

The fishnet comparison shows that both datasets share 87% of the grid (each cell is used or not used in the same way), 3% of cells are only used on Wikiloc against 10% on GPSies.

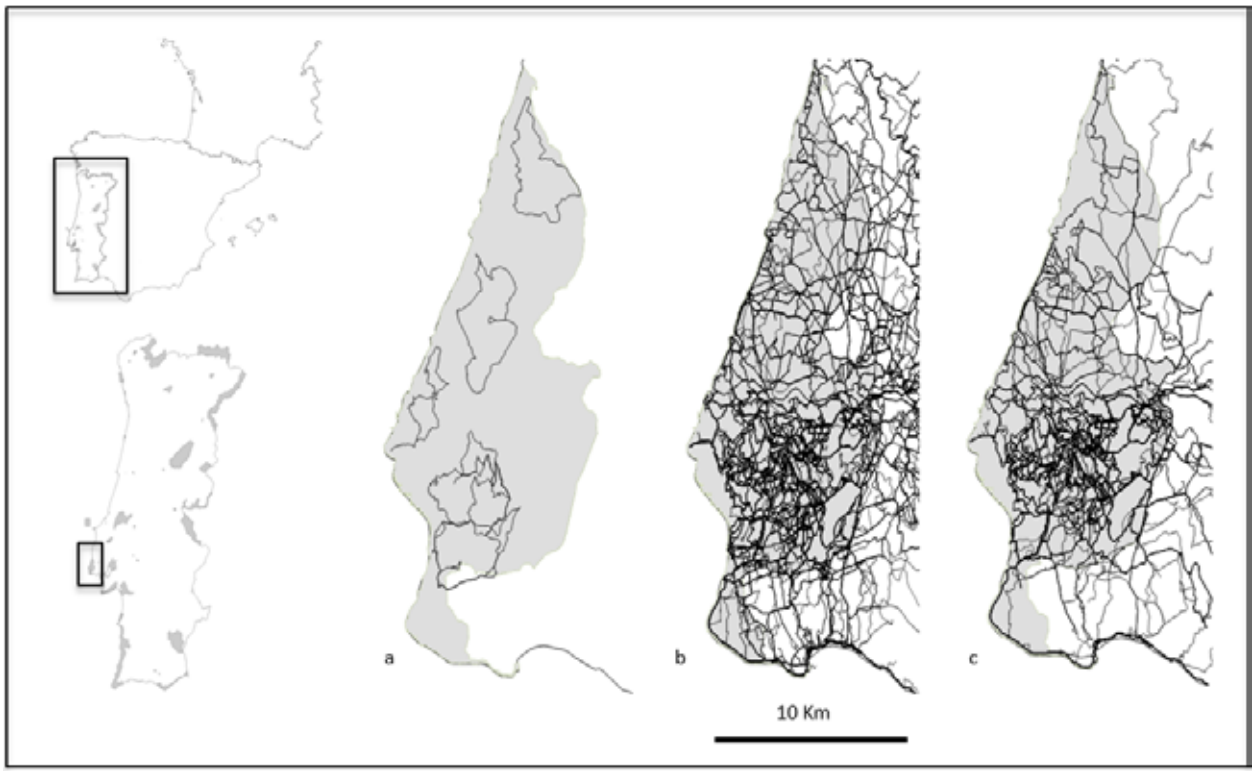

Fig. 1. Comparison of the mountain biking tracks in Sintra-Cascais Natural Park: (a) offered by the Nature Sports Chart Plan; (b) with those obtained with GPSies and Wikiloc (c), for Sintra and Cascais datasets.

Conclusions

The 7 independent trails offered by the PNSC's CND for mountain biking are not at all an offer that satisfies the pressure of this activity in the park. In fact, a dense web of trails, sometimes opened by mountain bikers themselves is being used. This web crosses not only roads where it causes no trouble but also some habitats and sensitive areas where it should not be, showing that management measures are needed.

The differences between results from both webshare services are probably due to GPSies popularity within this activity. Being older and with more users, results in more tracks uploaded and with higher resolution than Wikiloc. Both data sources have proven to be valid for MTB monitoring in PNSC, since they both represent well the spatialization of this activity in the park, without the need of many resources. That being said, GPSies provided more resolution, almost all trails and paths found on Wikiloc are also available on GPSies, making the use of this last one enough on its own to track MTB in the study area. For other activities and/or protected areas this might not be the case.

Results from the fishnet grid analysis confirm these findings, stating GPSies as the best webshare service to gather information for future management actions to be set by the park authority with the commitment of all involved stakeholders.

Acknowledgements

This paper presents research results of the Strategic Project of e-GEO (PEstOE/SADG/UIo161/2011) Research Centre for Geography and Regional Planning funded by the Portuguese State Budget through the Fundação para a Ciência e Tecnologia.

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Assessing the relative impacts on plant composition and functional composition from mountain biking and hiking

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Introduction

Mountain biking is an increasingly popular activity in natural areas in North America, Europe and Australia. Conflict involving mountain biking in parks often revolves around concerns regarding its relative environmental impacts compared to other activities such as hiking and horse riding (Marion and Wimpey 2007). Despite an increasing literature on the environmental impacts of a range of recreational activities, there is still limited directly comparative research on the impacts of mountain biking and other activities such as hiking (Thurston and Reader 2001; Pickering *et al*. 2010). Consequently, we compared the relative impacts of mountain bike riding and hiking off trail using a modified common trampling experimental methodology to address this often controversial issue.

Study area

The experiments were conducted in Kosciuszko National Park (6900 km2), in south eastern Australia, which is a UNESCO biosphere reserve and receives around three million visits a year, although mostly in winter. Mountain biking is an increasingly popular summer activity in the Park and is being actively promoted and supported by ski resorts, the park agency and local tourism operators.

Methods

A randomized block experimental design was used where seven treatments (control with no riding or hiking; 25, 75, 200 and 500 passes by bike riders; and 200 and 500 passes by hikers) were randomly allocated to one of seven 4 x 0.25 m quadrats on untrampled, ungrazed subalpine grassland in six replicate blocks (e.g. 6 replicates for each treatment) (see Pickering *et al*. 2011 for further details). Plant height, vegetation cover, and the cover of each species was measured in each of the 42 quadrats two weeks after they were ridden on/trampled. Data on four vegetative functional traits that are important in terms of competition and stress (canopy height, leaf area, percentage dry weight of leaves and Specific Leaf Area) for each species were obtained from a database of functional traits for Australia alpine and subalpine plants (Pickering and Venn 2013).

From the trait data, we calculated the functional composition for each quadrat as community trait weighted means (CTWM), where the traits of each species were weighted by its relative cover to give an overall average community trait value per quadrat (Pickering and Venn 2013). Single dependent variables were analysed using One-Way Randomized Complete Block ANOVA, while plant and functional composition were analysed using ordinations and ANOSIM.

Results

Mountain biking and hiking both had negative impacts on vegetation. For mountain biking this included significant reductions in vegetation height, cover and species richness, as well as changes in species composition and increased litter compared to control quadrats. The greatest impact occurred after the largest number of passes, with a 43% reduction in height, 25% reduction in vegetation cover, and 40% few species per quadrat after 500 passes by bike riders. These impacts were either the same or only slightly greater than those from the equivalent number of passes by hikers. After 500 passes by mountain bikers there were greater declines in vegetation cover than from 500 passes by hikers, with herb cover particularly sensitive to riding, resulting in increased litter, and greater reductions in species richness compared to hiking. There were no significant differences between the two activities in their relative impacts on the cover of shrubs and graminoids or vegetation height.

The effects of riding and hiking on dominant species in this community differed. The taller tussock Smooth-blue Snow Grass (Poa fawcettiae, 95% overlapping cover) that has large tough leaves was more resistant to both activities than the low growing herbs with small thin leaves such as Asperula gunnii (33%). Consequently, the relative cover of P. fawcettiae increased with use by mountain bikers and hikers while that of A. gunnii dramatically decreased. These changes in the relative proportion of the two species resulted in unanticipated changes in CTWM with the vegetation remaining after mountain biking and hiking dominated by more resistant plants with larger tougher leaves.

Discussion

This research demonstrates that both mountain biking and hiking can damage vegetation when they occur off trails and that their relative impacts per fixed distance may not be as different as previously indicated. The resistance of the vegetation to damage from either activity was primarily driven by the different responses of two species; the dominant grass was relatively resistant to trampling while the most common herb was not. These responses resulted in some unexpected changes in the functional composition of quadrats. Further research in different ecosystems with other combinations of species and functional traits is required to test the generality of the results obtained here. Considering the political and social sensitivity regarding this issue, and its importance in terms of justifying management decisions, such research should be a priority.

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Figure 1. Experimental mountain biking riding in action on Australian subalpine grassland.

Profiling MTB users' preferences within protected areas through Webshare services

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Introduction

Recreational use of protected areas (PA) is increasing worldwide demanding for better knowledge and strategies in order to fulfil the mission of these territories regarding their conservation objectives and social and economic goals. A common strategy that usually results in less management and user conflicts offers a network of recreational facilities, normally through trails or footpaths and interpretation centres, but not all recreational or PAs are equipped with these facilities. In those cases with special emphasis on areas close to or within large residential areas, informal use may expand to the whole territory. Even where a good network of suitable trails for recreational activities exists, informal use can easily lead to conflicts. Profiling user's preferences might help managers and decision makers design a proper offer of outdoor activities. Knowing what people like to do could avoid strategic errors, by offering to local users and visitors the minim satisfaction regarding their motivations and expectations. Nogueira Mendes *et al* (2012) used a webshare service to collect data regarding spatial use of Mountain Biking (MTB) on Arrrábida Natural Park (PNArr) in Portugal, suggesting further work to test if these web resources could be used to monitor recreational activities within protected areas. This study intends to test if this Voluntary Geographical Data could be used to profile average bikers preferences in order to better understand and better manage MTB within these territories.

Study Area

The study area includes the property limits of Arrábida´s World Heritage Nomination Site, which is located in Lisbon Metropolitan Area, 45 minutes away from Lisbon and that includes the total area of (PNArr). This area is characterized by a high diversity of Mediterranean habitats due to its singular location and geology, with small mountains, valleys and plateaus making it a mountain biking paradise for local users.

Currently all involved managers of this territory, Natural Park Authority, local Municipalities and the Association of Setubal's Region Municipalities are committed to build a recreational offer that could accommodate and hold both the actual demand and a most probably future increase of use.

Material and Methods

The main dataset used in this study was collected from GPSies.com, one of the oldest and more popular free webshare services based on a WebGIS. By April 3rd 2014 it held over 54.000 GPS tracks from Portugal reaching a total of 300.000.000 km. Each track is classified within 32 different activities such as hiking, climbing, mountain biking, horse riding, among others that are organized in six categories of which "By Wheel" represents 55% of the total kilometres, uploaded by GPSies users with 172.937.766 km of routes in Portugal.

GPSies queries were configured to ensure that all uploaded tracks were in a radius of 25 km from Palmela, using selective tracks' length to limit each query to less than 250 tracks. Within this website, if the query results in a higher number, only the latest 250 results are listed and available to be downloaded.

Each subset was retrained in .gpx and .kml files and then converted into shape files and analysed in a GIS environment, using ESRI® ArcGIS™ 10.2 ArcInfo. Following the methodology proposed by Nogueira Mendes *et al* (2012) spatial analysis was carried out by overlaying a fishnet square grid of 25 m on the tracks dataset to determine the intensity and spatial use on Mountain biking in Arrábida. Finally the result was converted into a binary raster (0 = no MTB v.s 1 = MTB track) and the same grid was used with the Land Use / Land Cover Map of Continental Portugal (that follows the CORINE Land Cover nomenclature) to identify the most attractable land-cover classes for this activity within the study area through a raster calculator analysis.

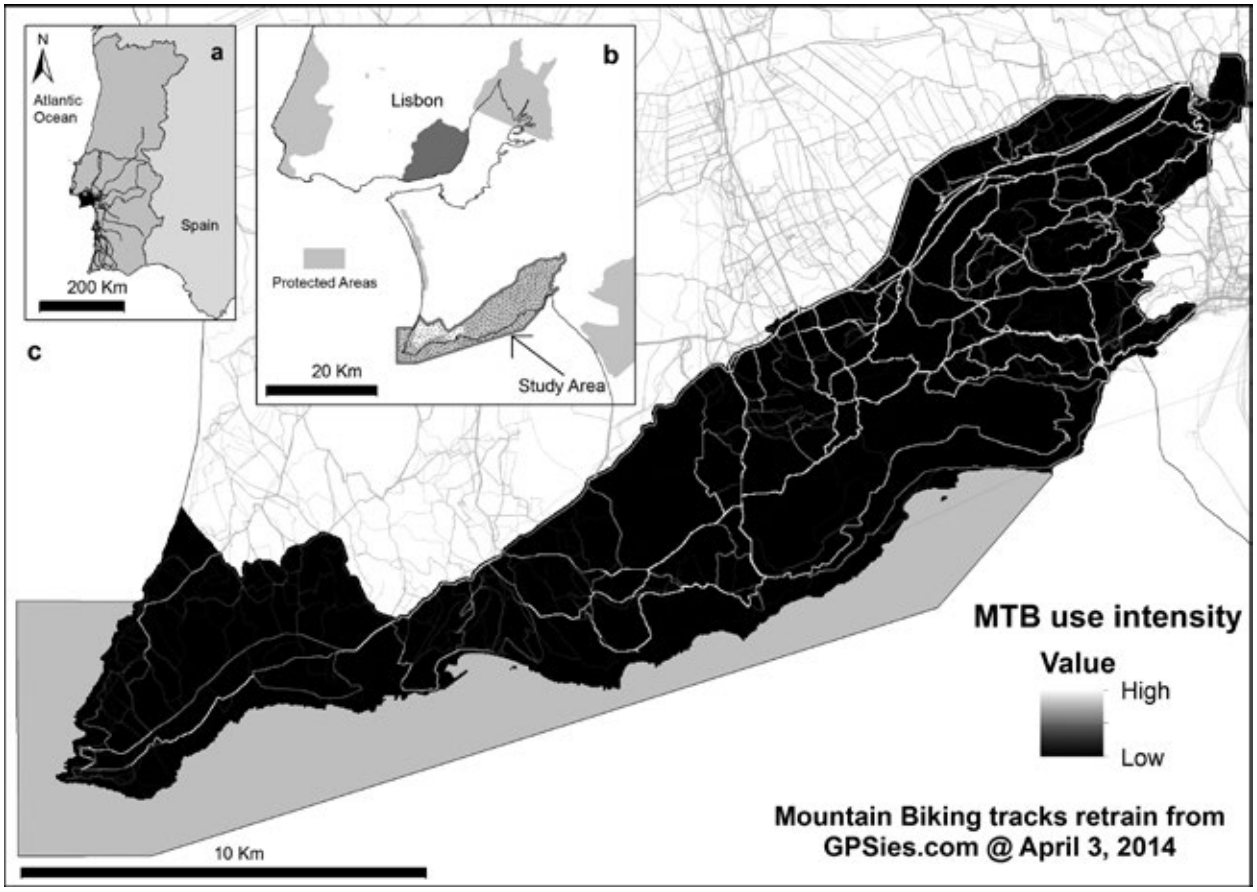

Figure 1 - Mountain Biking tracks retrain from GPSies on April 3 2014. (a) Portugal mainland; (b) Lisbon Metropolitan Area and surrounding Protected Areas; (c) Study area.

Results and Analysis

The total dataset downloaded from GPSies consisted of 4.431 tracks of which 2.479 crossed the study area. A closer analysis suggests that other 47 tracks were not consistent with this study's objective, either because the track obtained included several bicycle rides or several topological errors and erratic track points that extended the track length to absurd distances. The main reason for these errors is due to the fact that submitted information is 100% voluntary, and includes data noise. The final dataset included 2.432 tracks submitted from October 2006 to April 2014 by 378 identified users that upload 2.145 tracks, the last 286 anonymous. Over 55% of users uploaded more than 1 track up to a maximum of 169 (a clear example of a more committed user). The number of tracks submitted per year raised from 4 in 2006 to 594 in 2011 (at the same time that smartphones with assisted GPS antenna were becoming popular in Portugal) with an increase rate of 222% if compared to 2010. Uploading of tracks dropped in 2012 to 574 and to 425 in 2013. In the first trimester of 2014 only 80 tracks were submitted. This could be due to the dispersion of other web-services similar to GPSies like, Strava, Endomondo and others that offer a stronger community feeling or other added values like personal training and medicals advice.

The average length of Arrábida MTB rides is 47,7 km, maximum distances included North/South crossing rides from Lisbon to cape Sagres, in Algarve for example (reaching over 200 km) but that just intersected the study area. 98% of the analysed tracks were within distances of up to 100 km of which 57,15% were done inside of the study area, even if 76,89% of the rides started in the surroundings locations. Regarding land-cover classes heterogeneous agricultural areas (13.21%), forests (22.52%) and scrub and/or herbaceous vegetation associations (35.20%) are the top 3 favourite land uses used in Arrábida for MTB.

Conclusions

Comparable to what it has been tested with other activities such as geocaching (Nogueira Mendes, *et al* 2013) voluntary geographical data can provide important clues regarding how the territory is being used, making it a valuable tool for management of outdoor activities within recreational and PA. In this case, average preferences in terms of distances and favourite trails of MTB users of Arrábida could be inferred and could be used to design an official trails' network that could regulate this high impact activity. Further analysis could be performed with these datasets to confirm pavement preferences for example, and if results are consistent in other PAs.

As any other web based resource, gathering geographical data from these services should be done carefully since quick shifts and massive trends on internet use can be very fast. While in Portugal GPSies is still a very popular service (with about 125 new tracks for mountain biking per week) in other countries there might be other services with the same popularity level. Nevertheless searching the web is always a good starting point in terms of recreational uses monitor. If people usually do it, it is most likely that someone has posted it on the web.

Acknowledgements

This paper presents research results of the Strategic Project of e-GEO (PEstOE/SADG/UIo161/2011) Research Centre for Geography and Regional Planning funded by the Portuguese State Budget through the Fundação para a Ciência e Tecnologia.

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Assessing technical trail features for mountain biking: examples from four countries

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Introduction

Mountain biking is an outdoor activity with growing popularity internationally. Prior to mid-1980s it was largely a North American phenomenon, but since then mountain biking activities have emerged in most continents, mostly notable in Australia and Europe (Webber, 2007; Pickering, *et al.*, 2010b). The continued increase in mountain biking participation is accompanied by diversifying riding styles, including trail riding, cross-country and freeriding. Each mountain biking style is associated with different set of management issues. This presentation focuses on the management concerns about one particular style of mountain biking – freeriding.

The key element of a freeriding experience is technical challenges (Webber, 2007). Mountain biking trails that traverse rough terrains offer such opportunities naturally, but when challenging terrains are limited or non-existent human-made trail technical features (TTFs) are often created to provide such experience. IMBA (2004) defined TTFs as obstacles on the trail requiring negotiation and natural obstacles that add challenge by impeding travel or features introduced to the trail to add technical challenge. While some TTFs are formally provided by public land agencies, many are built unofficially by mountain bikers using local or foreign materials. The existence and use of unofficial TTFs raise management concerns about potential ecological impacts and visitor safety, though such concerns can also be applied to their official counterparts (Newsome and Davie, 2009; Pickering *et al.*, 2010).

The purpose of this presentation is to provide the first international overview of TTFs as an emerging visitor impact management issue. Specifically, we highlight and discuss results from initial assessments of TTFs from Australia, the United States, Germany and Portugal.

Methods

Pickering *et al.* (2010a) published the first detailed assessment protocol specifically for TTFs. This protocol (TTF-v1) consisted of 24 attributes in four broad categories, including TTF characteristics, site details, environmental impacts, and safety/management issues. They applied the protocol to the Blackbutt Forest in southeastern Queensland, Australia. Kollar and Leung (2010) adapted TTF-v1 with a different sampling design, three additional assessment items (TTF generic type, TTF naturalness and ground cover) and two modified items (TTF safety and canopy cover). This modified TTF assessment protocol (TTF-v2) was applied to two urban-proximate mountain biking sites located in central North Carolina (Legend Park) and Montana (Spencer Mountain) in the United States (Kollar, 2011). Subsequently, TTF-v2 was applied to the Deister mountains near Hannover, Germany, a popular mountain biking destination and ecologically valuable NATURA 2000 protected area (Lehrke *et al.*, 2010). A rapid assessment of TTFs was also conducted in Sintra-Cascais National Park near Lisbon, Portugal. Due to logistical constraints only locations and TTF types were recorded on the Portuguese site.

Results

Direct quantitative comparisons of TTF assessment data across four countries are not feasible due to the preliminary nature of this project, but some initial comparisons are possible as the assessment protocols (TTF-v1 and TTF-v2) had many common assessment items. Below is a brief country summary.

Australia: A total of 116 TTFs of eight TTF types were identified. Jumps were found to be the most common TTF type. Almost all features received good or moderate condition scores. There was a direct association of TTFs with removal of vegetation, soil, and rocks to construct TTFs. Other impacts include bare ground exposure and the introduction of littering and foreign materials. There were significant differences among the TTF types on size and dimensions of TTFs as well as the extent of bare ground (Pickering *et al*, 2010a).

USA: A total of 287 natural and built TTFs were assessed in the two U.S. study sites, representing 14 different types of TTFs. The most common TTF types in Legend Park (coastal plain site in North Carolina) site were bridges and drop-off features, while jump features were most common in Spencer Mountain (montane site in Montana). Wood was the most dominant material used for constructing TTFs on both sites. Two thirds of the TTFs were in good condition while a higher

proportion of TTFs in Legend Park received lower safety ratings (Kollar, 2011). More TTFs were clustered to provide continuous challenges on the montane site.

Europe (Germany and Portugal): TTF assessment data of the German and Portuguese sites are being compiled and only limited information is available at the time of this writing. At the Deister site near Hannover, 103 natural and built TTFs were identified. The most common TTF types included single or multiple ramps (59), berms (17) and hill-natural terrain (13). Some TTFs are combinations of multiple types, such as ramp + berm. Soil and wood was the most common construction material for TTFs. The Portuguese site (Sintra-Cascais National Park) was recently assessed. Four-nine TTFs were identified on two popular mountain biking trails. The most common TTF types included bridges (19) and ramps/ jumps (15).

Discussion

This presentation provides the first international look at trail technical features (TTFs) and hopefully stimulates research attention and collaboration in this topic. The assessment results suggest that some TTF types are common across different countries, such as jumps and bridges, and they are mostly built using natural materials collected from adjacent areas. While some management concerns about TTFs such as safety are comparable, environmental and social impacts may vary across countries due to differences in terrains, ecosystems and user profiles. Despite the contextual complexity, by applying standardized assessment protocols researchers and managers can share and compare TTF data more directly and begin to explore common issues and solutions. Such efforts will benefit future planning and management of mountain bike trails and sites.

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SESSION 4C MANAGEMENT CHALLENGES IN PROTECTED AREAS

Administrative procedures for operation of a national visitor use monitoring program in protected areas

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Parks and protected areas often attract significant public interest, which in turn leads to a stream of visitors who invest money, time, and effort to experience these areas in person. Many factors determine the experience of visitors including the conditions of the resource itself, the logistical support available, and the attitudes of people contacted, including the park staff and other visitors. Visitors' opinions affect the perceptions of the site by other potential visitors, and by political authorities. The numbers from monitoring programs are critical indicators of the natural, social and economic functions performed by parks and their caretakers. Monitoring public use is important and is a fundamental responsibility for managers.

Many park agencies operate visitor monitoring programs, at various levels of depth and sophistication. Hornback and Eagles (1999) and Kajala *et al*. (2007) provided the basic definitions and possible approaches directing a monitoring program. However, there is very little literature on choosing the adequate methods and techniques in concert with available administrative resources, both financial and managerial. This paper will explore the methods, administrative approaches, and resources needed for a visitor monitoring program in a park agency.

We propose that a visitor monitoring program requires administrative procedures in the following areas: 1) agency policy; 2) monitoring objectives; 3) level of program development; 4) staff resources; 5) financial commitments, 6) measurement technologies; 7) data storage; and, 8) communication technologies. Each of these procedures is influenced by the scale of the program: national, regional, park, or site.

Hornback and Eagles (1999) suggest that there are five progressive levels within a public use program: an initial level (I) of public use reporting program and moving onto basic (II), intermediate (III), developed (IV) and advanced (V) levels. Each higher level results in greater accuracy and detail of public use data and a corresponding increase in the required staff time, hardware and funding. These five levels must be coordinated within the overall administrative procedures and the scale of the program.

The larger scales, especially national visitor monitoring systems, have several benefits compared to the more regional or local approaches. They help ensuring that monitoring is implemented in a uniform manner across the country, enabling comparability of the results across areas and time and further calculations e.g. on effectiveness of protected area management. For example, in Finland the national visitor monitoring system has proven to be able to play an important role in justifying resources for protected area management (Figure 1). Given the importance of this economic impact, it is vital that a national visitor monitoring program be properly established and operated.

Figure 1. According to a Finnish assessment based on national visitor monitoring data, 1 EUR investment in national parks and other key protected areas results in 10 EUR return to local economies (Kajala 2012).

However, national visitor monitoring systems also have some challenges. By definition, monitoring means inflexibility; establishing a national program requires adopting rigid methodology and technical solutions. This reduces flexibility compared to case studies, with which one can test and use, e.g. newest technical solutions or ask questions on current management issues. Consequently, no matter how good a visitor monitoring system is, it can never solve all the information needs related to visitor use and management in protected areas. Thus, in addition to a visitor monitoring system, also other ways of gathering visitor data can be needed. For example, for management planning information needs, GIS-based internet surveys allowing visitors to give feedback and ideas in connection to a particular location is becoming a very useful tool.

This paper will provide a structure that can be used by policy makers and senior managers in the creation of a park agency and park visitor use monitoring program. It will also analyse the benefits and challenges of national visitor monitoring systems. It provides a conceptual basis that can be used for further research.

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Management challenges of the hiking trails crossing Natura 2000 areas in the Azores (Portugal)

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Natura 2000 is a coherent net of areas created within the frame of two EU Directives (Birds Directive: 79/409/CEE revised by Directive 2009/147/EC; Habitats Directive: 92/43/CEE), where human activities and nature conservation are meant to be compatible in a sustainable manner. In the Azores, this net of Protected Areas (PAs) includes 27 Special Areas of Conservation (SACs) and 25 Special Protection Areas (SPAs), spread among 9 islands that compose the Azorean archipelago. These 9 islands differ greatly in terms of population density and tourist demand, so we chose two of them to characterize and evaluate the existing hiking trails crossing Natura 2000 areas of those islands, and also the potential to develop new ones. The islands chosen were, (1) São Miguel, the larger and most populated island, also experiencing the greatest tourist pressure; (2) Flores, one of the smallest and less populated island, experiencing a much less tourist pressure but with an increasing rate of new visits. These two islands also differ greatly in terms of their PAs percentage cover, being much greater in Flores Island.

Globally 8 trails were studied (Table 1), 5 in São Miguel and 3 in Flores. These trails were evaluated based on a *Decision Making Analysis* process, adapted from Eastman *et al.* (1995), according to fitness and quality aspects. Safety and vulnerability criteria were the two main aspects related to fitness whereas biodiversity, geodiversity, landscape and cultural / patrimony aspects, were assessed to characterize the quality of the trails. In the end, these were grouped in two types: a type factor, criteria adding or decreasing the value to a certain area; a type constraint, criteria limiting the selection of the areas. Thus, trails with a constraint behaviour due to fitness criteria were excluded, and those were: PRC2SMI, PRPBAP and PRLFC, all of them located in S. Miguel island.

Table 1

Hiking Trails	Acronyms	Distance (m)	Altitude (m)			Protected Area
			Minimal	Mean	Maximum	
Island of São Miguel						
Praia - Lagoa do Fogo	PRC2SMI*	6000	246	424	559	Lagoa do Fogo
Pico da Barrosa - Água de Pau	PRPBAP	6000	191	581	894	Lagoa do Fogo
Pico da Barrosa - Praia	PRPBRV	8000	246	481	900	Lagoa do Fogo
Lagoa do Fogo – Monte Escuro	PRLFME	6000	580	633	752	Lagoa do Fogo
Lagoa do Fogo - Circular	PRLFC	4000	580	587	702	Lagoa do Fogo
Island of Flores						
Ponta Delgada -Fajã Grande	PR1FLO	12000	120	271	374	Costa Nordeste
Poça do Bacalhau	PR3FLO	7000	54	527	629	Morro Alto
Cedros - Ponta Ruiva	PRCPR	3500	238	266	315	Costa Nordeste

* Trail homologated by the Azorean Regional Government

Other aspects such as, demand and profile of tourists visiting the areas (Queiroz *et al.*, in press), impacts from tourist activities on the protected habitats (Queiroz *et al.*, 2014a), and carrying capacity of the trails (Queiroz *et al.*, 2014b), were also evaluated and are already published elsewhere. From the characterization and evaluation of the trails, we realize that the offer must be rethought given the constraints of some of the existing trails. The chosen trails, along with the already published data, can serve as a model to build a set of recommendations for a management proposal for the Azorean trails. These recommendations could concern the number of daily visitors allowed (given the carrying capacity calculated), the type of recreational activities that could take place in the area (given the sensitivity of the areas), or the possibility of charging a fee for conservation purposes (given the results from the enquiries made to the tourists). Since the Azorean archipelago is a diverse territory, it would be wise to build a management plan according to each of the 9 islands specificities, which could

then be developed within the frame of each island's Natural Park (PNI). These PNIs have been created along the last few years, starting with the São Miguel PNI, created by the Regional Decree DLR n.º 19/2008/A, of 8 of July, and ending by the creation of the Flores PNI, by the Regional Decree DLR n.º 8/2011/A, of 23 of March.

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Monitoring and management of visitors on Pohorje Mountain active raised bogs (Slovenia)

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Slovenia is due to its picturesque nature and unique natural resources identified as a country with great potential for the development of green, responsible tourism. Protected areas offer visitors to experience nature qualitatively; at the same time tourism and recreation increasingly affect these areas. Preserved natural areas attract people, so visits to these sites are becoming more frequent and numerous. It is in most cases impossible to leave these areas to nature conservation only; therefore it is necessary to actively regulate visits or guide the visitors away from the most preserved natural areas to areas which are less sensitive and less valuable from the point of nature conservation importance. It is the role of the site manager to properly arrange possible visits to the vulnerable nature areas with suitable infrastructure (notice, information, channelling/redirecting, warning boards) and in addition attracting visitors to less vulnerable areas in nature. Suitable infrastructure also raises awareness and environmentally educates visitors to such an extent that they feel obliged to respect the rules of behaviour in the natural environment.

Research into movement of visitors is essential if we want to design the infrastructure so that it regulates visitors' activities in a way that minimizes its effect on nature but at the same time still preserves the attractiveness. Data gathered from the field (recording with counters, observation of visitors, etc.) should be meaningfully incorporated in the planning of visitors channelling (construction of new trails, the relevant information and interpretational infrastructure, construction of classrooms in nature, etc).

When monitoring visits, it is necessary to use both qualitative and quantitative methods, since only a combination of both gives good information about the visits in a given area, which is monitored. Data gathered from monitoring of visits to protected areas are an important basis for communication with stakeholders in the areas with high nature value (tourist companies, foresters, agrarians, nature conservationists, hiking clubs) and help facilitate coordination of various activities in the area. Harmonization of activities in a given area requires considerable coordination, time and patience, but it is essential for successful implementation of planned activities.

This paper deals with the monitoring of visitors in protected wetlands on Pohorje Mountain range (Slovenia) and presents implemented activities dealing with visitor management in the area. Activities were carried out through the project WETMAN - Conservation and Management of Freshwater Wetlands and Slovenia (LIFE + Nature; LIFE09 NAT/SI/00374; Y2011-2015). Wetlands are one of the most endangered habitats in Slovenia, providing ecosystem, cultural, touristic and aesthetic services for both nature and people. The aim of the project was the restoration and improvement of the conservation status of six Slovenian wetlands, which include the Pohorje bogs. Visitors monitoring and assessment of their behaviour in the area of wetlands in Pohorje was the basis for the planning of construction of hiking infrastructure in the area of Pohorje wetlands.

The three target wetlands lie within the Pohorje forest reserves and are included in the Natura 2000 ecological network (SCI 3000270 Pohorje, Pohorje SPA 5000006). Areas are popular tourist points and are accessed by hiking trails. Most of the hiking trails have improper signage and individual parts are poorly maintained. In the initial phase the inventory of the state of the infrastructure was carried out (state of: the trail, route marker, information, notification and directional signs and objects). For the purposes of reconstruction of the tourist infrastructure and designing the channelling of visitors in the areas we monitored visitors through qualitative and quantitative method in a period of 1. 10. 2011 – 30. 9. 2013. Counting of visitors is being carried out by means of electronic infra-red sensors (PIR) from the 1st of October 2011 onwards. Sensors were installed at entry points on three active raised bogs (Ribniško barje bogs, Lovrenško barje bog and Črno jezero bog). Two-year monitoring showed that the areas are visited by over 53,000 visitors per year. In the four periods of the year, a visit was distributed as follows: 4% of visitors during the period from 01.01. - 31.03, 28% between 01.04. and 30.06, 57% between 01.07. and 30.09., and 11% of visitors in the period 01.10. till 31.12. The highest visitation was in August (30% of total annual visits), which is expected since this is vacations' time. A maximum daily and hourly visit to all three areas was detected during weekends and holidays. The peaks were reported in the month of August and during Labour Day holidays. The majority of visitors throughout the day are classified between 11 and 14 hours. The qualitative method gave us the patterns of retention of visitors on the areas as well as the structure of the visitors (groups, families and individuals). The structure of the data showed that existing infrastructure is needed to be comprehensively regulated and adjusted according to the patterns of visitors' movements. The information infrastructure was established before entering wetland areas, which include signalling and routing content. Existing old wooden pathways were replaced and upgraded with elements of

the circular path using local natural materials with low carbon footprint. A total of 2000 meters of wooden paths were reconstructed and a watching tower renovated. Parallel, a new wooden footpath was put into use, with a purpose to shift visiting from natural sensitive bogs to a less sensitive one. By properly setting up infrastructure, which serves limiting the negative consequences of visitors' activities on the natural environment the area got recognizable facilities. These are now used also for the implementation of environmental education and provide visitors a better understanding of the area and emphasize the importance of preserving high conservation value areas (HCVA).

Picture: A case of new environmental infrastructure on active raised bogs of Pohorje (Slovenia)

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The EU's proposed 'Fitness Check' on nature legislation – potential impacts on nature conservation and the provision of ecosystem services

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Background

With the EU Commission's initiated Regulatory Fitness and Performance Programme (REFIT), the EU nature legislation will undergo a review starting in 2015 (DG Environment 2014). The so-called 'Fitness Check' of Natura 2000 - namely the Birds (2009/147/EC) and the Habitats (92/43/EEC) Directive - will assess whether the regulatory framework in this policy sector is "fit for purpose." The review will mainly focus on several key points such as:

- the implementation and integration successes and problems,
- the costs of implementation and of non-implementation of the legislation,
- opportunities for improving implementation and reducing administrative burden without compromising the integrity of the purpose of the directives,
- the situation of implementation in different EU countries,
- and the views of key stakeholder groups.

While in general, a review of existing legislation is a useful tool for assessment, in the case of Natura 2000, several key EU members - among them Germany, the Netherlands and the UK - have signalled to show an interest in fundamentally questioning the need for nature conservation regulation on the European policy level at all. Especially given the current situation of the UK's EU membership, Natura 2000 legislation is at risk of becoming a subject for negotiations to maintain the UK's EU membership.

Natura 2000 is the world's largest network of protected sites and comprises about 20% of the European landmass (Bundesamt für Naturschutz 2014). Hence, these sites provide a huge amount of ecosystem services. Aside from the provisioning services, cultural ecosystem services such as providing recreation opportunities are an important factor to weigh in. Although the TEEB study is aiming at valuation ecosystem services and their benefits, there are no studies on the recreational value of Natura 2000.

Objectives and Research Questions

As the EU Commission will launch a public Internet consultation and other means of stakeholder involvement (DG Environment 2014b) in early 2015, several research needs can be identified that should be addressed during these consultations. While the nature legislations' benefits from nature conservation are quite clear and obvious, there is little information about the benefits from ecosystem services provided by the Natura 2000 network. Because of its extent across Europe, Natura 2000 sites are very likely to produce a high amount of cultural ecosystem services such as providing for recreational opportunities. Hence, a potential rollback on nature legislation could also potentially harm recreation in EU member states. The relationship between Natura 2000 sites, their management and recreational opportunities is not known so far, requiring scientific studies to produce reliable data.

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Babia and Luna future natural park (Leon, Spain): between a paradise and a desert for visitors

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European natural areas have significant values and they are the result of hundreds of years of exploitation of their natural resources. In fact, scarcely one could find an actual natural area in Europe, even in the highest mountains. Thus, it is extremely important to manage these areas in order to maintain these landscapes as well as to provide resources to reach a sustainable development to local communities.

Babia and Luna future natural park: a general view.

Babia and Luna future Natural Park are located in the north of Spain, on the south side of Cantabrian Mountains. It was a traditional place where Leon Kings used to come so as to hunt or to relax. This is one of the reasons why in Spain to have one's head in the clouds may be called "to be in Babia" ("estar en Babia"). There is another hypothesis related with its pastoral past.

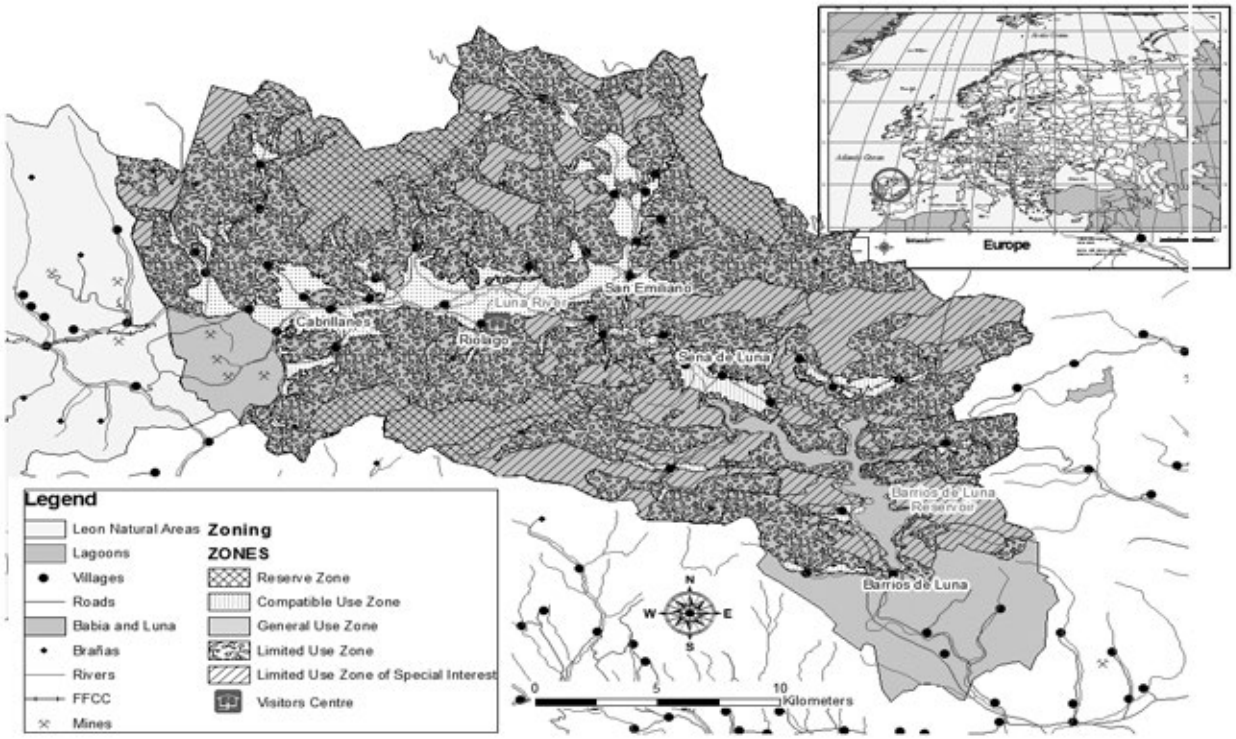

Fig. 1. Babia and Luna future natural park map.

The current landscapes of Babia and Luna are the result of centuries of land management. Forests were cut and prairies were improved in order to reach best pasturage for livestock, mainly sheep, cows and horses, resulting in the current naturalized landscapes. This past is still important, but changes have involved a new conception of the land also.

In this context, Spanish natural areas usually have common characteristics such as being marginal, deprived, mountainous areas, or having aging and lower density of population. Moreover, their amount of people has been decreasing for the last century, and this process has seen an acceleration since sixties when modernization and migration changes occurred in Spanish countryside. In addition, changes related to coal mining took place in these areas where the most important coalmines of Spain are located.

Although the portion of land is small and the mining jobs are not numerous, the economy was clearly influenced by this economic issue. However, nowadays its weight is lower and lower and people do not see confident future. Thus, people have turned their eyes to tourism –natural areas' tourism– as a way to develop the area.

The natural area: a brief history

Babia and Luna future Natural Park has 57,628 ha. Four municipalities are included totally or partially: Cabrillanes, San Emiliano, Sena de Luna and Barrios de Luna.

Babia and Luna Natural Area as Valle de San Emiliano Natural Area was included in Castile and Leon Natural Areas' Act in 1991. In this law a network of natural areas with a planning to follow was established in order to reach the status of a natural area (a natural park, reserve or monument). Natural areas' planning as a waterfall process:

First level: National law: the National Heritage and Biodiversity Act (2007) and Regional Law: the Castile and Leon Natural Areas Act (1991).

Second level: Areas system plan: Natural Parks Program in Castile and Leon (2002). It is not properly a plan.

Third level: Management plans: Management Plans for Natural Resources (PORN). They are compulsory for every park or reserve, and they have to be approved before the declaration act. Concerning Babia and Luna natural area, it has just been approved in 2014 and it needs to be developed.

Fourth level: Master plans (PEUG). They put in action the PORN's orders. Nevertheless, there is no one in Castile and Leon.

Firth level: Sectoral plans. They are less developed although they are the most specific ones. The most common are conservation or public use, as well as sustainable development plans. However, Castile and Leon have no sustainable development plans, which could be extremely important for local communities.

Although the steps are clear, the issue is that while the management plans were drawn, socioeconomic situation was changing significantly and, therefore, natural resources could have been affected by external effects or by degradation, for instance.

On the contrary to the common feeling toward natural areas' declaration process, Babia and Luna population has been requesting a quick resolution because of their weak economy. Thus, local authorities have been demanding the declaration for years.

Leon Mountain area as a whole has suffered form depopulation and ageing because of migration movements, and these municipalities are not excluded. In fact, they have had almost 8,000 inhabitants in 1900 to 3,000 in 1991, but the depopulation is bigger and bigger each year.

This is the reason why authorities are in favour of having an actual natural area: to reach a sustainable development, mainly through tourism.

The opportunities to develop the area through tourism based on natural resources.

Babia and Luna not only have a wealthy biodiversity, but also have a wide range of natural resources that can be easily used in visitors' field to engage visitors eager to enjoy this magnificent nature.

As we said above, this natural area is located on the south side of Cantabrian Mountains. Here the visitors can find one of the highest peaks of these mountains: Peña Ubiña (2,417m). These mountains have karst processes, and one can find many examples of glacier evidences: lagoons, valleys, etc.

Vegetation is also important, with some important species like beech trees. However, prairies are everywhere, especially in highlands. Fauna is also rich, able to attract bird watching people.

Nevertheless, the issue is local resources that we want to focus on. Probably sheep are not worth seeing, but cows and especially horses would be important potentialities. People love looking at cows and taking photos with them, at least in Picos de Europa National Park, why not here? Concerning horses, they have a local breed: the Hispanic-Breton horse. It is a short but strong one, able to support weather bad conditions. Moreover, local dogs are extremely esteemed by their characteristics.

Finally, Babia and Luna have an important cultural heritage. The visitor centre (an old palace) is thought to be open this spring. There are also many possibilities to develop paths, viewpoints, picnic areas, etc. In addition, some nature companies

are bound to serve visitors' expectations.

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SESSION 4D TOURISM VALORISATION OF PROTECTED AREAS – PLANNING AND GOVERNANCE ISSUES

Economic valuation of birding events: the example of crane tourism at Vorpommersche Boddenlandschaft national park, Germany

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Introduction

This study is the first of its kind to explore empirically the economic value of birding events in German national parks. In general, national parks may contribute to a sustainable development and conservation of a region through nature-based tourism (Hvenegaard 1998:701). National parks´ potential and economic effects in Germany have been examined and showed the motivation of the visitors, and structure and impact of their expenditures. Embedded in a continuative monitoring project that examines all national parks in Germany using a standardized methodology (Mayer *et al*. 2010), this research aims to examine the specific nature-based tourism branch of bird-watching in *Vorpommersche Boddenlandschaft national park*, Germany.

For several reasons, national parks attract wildlife watchers, but predominantly for the reason that visitors can witness wild animals in their natural habitat and behavior. Therefore, wildlife experiences such as bird-watching can be considered part of the concept of national parks. Along with the growing interest in nature-based tourism and the increasing popularity of bird-watching, avitourism (tourism directed at bird-watching) is rapidly growing (Biggs 2011: 128). Avitourism destinations are most often related to great birding events, such as the autumn migration where thousands of tourists come to watch the gathering of thousands of birds of one species. Those nature events generate economic, social and conservation benefit at natural areas of the world (Sekercoglu 2002: 282). The economic impact of birding-events has been investigated for many parts of the world. And although several studies provide insights into the economic value of bird-watching in North America or South Africa (e.g. Conradie 2013) no research has been done for Germany.

Survey area

Great birding events in Europe are the crane migrations. A great number of Common Cranes (*Grus grus*) breeding in Scandinavia stage at *Vorpommersche Boddenlandschaft* national park in Germany during their migration to southern winter grounds. Especially throughout autumn migration, up to 60,000 cranes converging at feeding and roosting sites can be observed daily. Within this six to eight week period, cranes attract thousands of birders, which is said to result in a touristic extension of summer high season. But this economic potential of the event of crane migration has so far only been sensed by the local tourist industry. To verify this economic impact, the research aims to show that the generated birding-tourism revenue generates income and contributes directly to the wellbeing of the national park region *Fischland-Darß-Zingst*.

Methods

In order to address the main problem of this research, qualitative and quantitative methods following the example set by Mayer *et al*. (2010) were used. To obtain the required information about crane tourists at *Vorpommersche Boddenlandschaft* national park, a questionnaire was designed, which was conducted on-site, face-to-face during crane migration in autumn 2013. 292 interviews were completed at eight crane observation points in the area. Four interview sites were viewpoints near roosting habitats of the Common Crane, where the birds – and thereby the birders – arrive approximately one hour before sunset and leave before sunrise. The other half of the questionnaires, were carried out at the feeding sites during daytime. Additionally to the interview including 50 questions, short interviews and counting helped to calculate number of tourists. Parallel to the methodology proposed by the national park project (Mayer *et al*. 2010), the questionnaire focused on the structure and size of expenditures by economic sector with an addition of crane-related expenses. Furthermore, it examined the visitor´s national park affinity and crane affinity. Based on a set of questions that addressed motivation of visitors, four types of tourists could be distinguished: visitors with high crane affinity, visitors with no crane affinity, visitors with a high national park affinity and visitors with no national park affinity.

Preliminary findings

Visitors with a high crane affinity, which are 74.3% of the respondents of this study, know about the crane migration and stated that it played a central role in their decision to visit *Vorpommersche Boddenlandschaft* national park. Out of this group of crane tourists 46,1% can be considered visitors with a high national park affinity compared to 24,0% in the group of non-crane tourists ($x^2$11,2; $p<0.001$), as they know about the protected area and ranked this label as the central reason for visiting this region. The shares of the proposed visitor types were compared to the findings of the general national park monitoring project, which also highlighted the national park affinity of visitors.

The results of the survey show that, in general, tourists with a high crane affinity spend more money than tourists without a high crane affinity. 1.90 Euros of the average crane-tourist's expenditures were directly crane-related. Other tourists only spend 0.50 Euros averagely on crane-related products or services (e.g. crane boat tours, walking tours, books). On accommodation and food, crane tourists spend 54.60 Euros daily, non-crane tourists only 48.80 Euros. For other categories, no variation in expenditures between crane tourists and non-crane tourist showed.

Many birding spots, like Platte River in Nebraska, USA, are visited for around two days (Edwards & Thompson 2009: 23). In the region of *Vorpommersche Boddenlandschaft* national park avitourists stay on average 6.7 nights. This increases the economic value of crane-related tourism. Visitors watch cranes 4.5 times in the course of their stay. And while 54.1% of the respondents named crane migration as a main reason for their trip in the open question, only 7.5% stated, that they would not have visited *Vorpommersche Boddenlandschaft* national park, if the cranes did not stopover in the area. This implies that most tourists see cranes as an attraction they are interested in observing, but only a small portion of the interviewed tourists took the trip only for the purpose of crane-watching.

For a statistical projection that evaluates the economic impact of the entire crane migration period (September and October) at *Vorpommersche Boddenlandschaft* national park, also data collected by crane-related vendors was used. With this information, the benefit associated with the nature event of crane migration was calculated and shows how nature has economic value and can be translated into economic benefit.

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Sustainable tourism from an economic perspective - demand and management within German Biosphere Reserves

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Introduction

Biosphere Reserves (BR) are internationally recognized protected areas, which are designated by the UNESCO to promote sustainable development. They seek to reconcile conservation of biological and cultural diversity with socio-economic development. Grassroots actions are the base to achieve partnership between people and nature. BR are ideal to test and demonstrate innovative approaches to sustainable development. On a regional scale UNESCO (1996) sees sustainable tourism as an important instrument to fulfill these objectives.

The main goal of this article is to evaluate the economic impacts of tourism in German BR and their ability to constitute pilot areas for sustainable tourism. After analyzing this nexus, the comprehensive study explores the management actions of the BR administration, which aim to enhance the regional economic impact in the most sustainable manner. In order to answer these research questions, two different methodological approaches were selected.

Methods

Demand side analysis

Studies on economic impact model the effects on income, output and employment caused by the injection of money into an economy by a certain activity. Within the international context, different approaches to regional economic impact assessment are common: cost-benefit analysis, multiplier models and input-output analysis (Fletcher 1989). Since the 1990s, an adaption of the Keynesian multiplier approach has gained most attention in Germany. In order to perform the impact analysis, six out of 15 German BR were selected. The study (Job *et al*. 2013) areas were chosen to represent the variety of German BR regarding touristic state of development (overnight stays etc.). During 2010-2013, 52.571 short and 8.253 long interviews were conducted, which were used to calculate tourism demand. Furthermore visitors were categorized by their affinity to the label BR and asked about their daily spending.

Management side analysis

The long-term aim to develop German BR as sustainable tourism destinations and to enhance the economic impacts requires the BR administrations to work on certain success factors. An extensive literature review (e.g. International Conference on Responsible Tourism in Destinations 2002; Hammer & Siegrist 2008) shows important development criteria for protected areas:

1) Organizational structure, resources and strategy of the BR administration in the field of tourism;
2) Tourism products and services that reflect, complement and enhance the destination, thereby reducing financial leakages while maximizing the economic benefit for the local population;
3) Marketing of the BR as an attractive destination in a consistent manner, thereby reflecting the natural, social and cultural integrity of the destination;
4) Cooperation with and participation of regional stakeholders.

These categories are used as a framework to analyze the performance of BR in sustainable tourism development from an economic perspective. In order to explore the actions of the BR management to influence tourism sustainably and enhance the economic impact of tourism within the region, qualitative interviews with the BR directors and other key persons were conducted.

Results

In total, the six investigated BR generate over twenty million tourists during one year. The share of over 60 % of day-trippers in four out of six BR shows the relevance of these target groups. The empirical results also demonstrate, that the percentage of visitors who know the BR status of the protected area, is very variable. At least half of the visitors are able to name the protection status of the region. The share of visitors, who are attracted by the label BR, was defined as the percentage of visitors that answered affirmatively three successive questions concerning the status of protection and their motivation. The group of visitors with a high affinity for the BR varies between 3.5 % for Pfälzerwald and 21.5 % for the Schaalsee region.

In addition to assessing the number of visitors and the various relevant visitor groups, the level of tourist expenditures is of major importance. The values for the visitors of BR are on average 17 Euros for the day-trippers and about 60 Euros for overnight guests. The gross tourist spending of the six investigated BR sums up to a total of nearly one billion Euros, which results in 28,000 income equivalents. The direct and indirect income has a big range within the group of BR that varies between 5.7 million for the Schaalsee (30.900 ha) region and nearly 204 million Euros in Südost-Rügen (22.900 ha), resulting from a significant higher visitor number and percentage of overnight visitors in the BR Südost-Rügen.

Management and development of tourism through the BR administration is often limited by a shortage of resources and a focus on other topics. Furthermore, cooperation between the regional tourism industry and the BR is in some cases limited and the label of the BR does not play a significant role within the marketing strategy. Nevertheless in some BR, e.g. Schaalsee and Rhön, the label BR is of higher importance within the tourist marketing strategy and cooperation between relevant touristic actors is further developed. Also within touristic product development the Rhön BR is a good example: around 150 enterprises from different branches are cooperating in one umbrella brand promoting the BR, while there are other BR with far less developed initiatives.

Discussion

The number of tourists shows that BR regions are important destinations on the German tourism market. The 28.000 income equivalents highlight that BR are an important economic factor in rural areas. However, the already known discrepancy between preferences for sustainable forms of holidays of tourist and their actual behavior exists within German BR (Budeanu 2007). This leaves work for the administrations: with the help of qualitative interviews it is indicated, how intensive the BR administrations are already working on the tourist promotion of BR in order to fulfill the sustainable development function. With a focus on organizational structures and resources, sustainable tourism product development, marketing and cooperation it is shown, where the work has to be improved (in order to become more attractive as a destination and enhance the economic effect of tourism within the region) and the obstacles that have to be managed in order to do so.

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Dilemma of rural diversification via tourism and nature conservation in peripheral Estonia

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Introduction

The study interfaces rural peripherisation, tourism development and nature conservation in Estonia in the framework of current rural depopulation, environmental policies and revitalisation of rural communities. The key question rests on the role of environmental policies and conservation, such as NATURE 2000, enlarging protected areas and implementing stricter nature protection laws for peripheral rural areas. The study combines a statistical analysis of socioeconomic trends and a questionnaire answered by local people. The statistical survey is based on key demographic, socio-economic and environmental indicators, summarizing mainly trends since the 1990s. The questionnaire, conducted in spring 2014, explores the attitude of local people towards nature protection: how satisfied they are with nature protection activities in their neighbourhood, if they understand the limitations and benefits of nature conservation, how those limitations and benefits impact their daily social practices. The recent results of the questionnaire are compared with reference datasets from 1997 and 2004. Five national parks (Karula, Lahemaa, Matsalu, Soomaa and Vilsandi) and two nature parks (Otepää and Haanja) were explored comprehensively.

Socio-economic trends of protected areas and peripheries

Socio-economic revitalisation in protected areas is an issue of growing interest in Estonia as protected areas cover one fifth of the Estonian territory. This is an issue of national importance. Several studies of protected areas in Estonia start from the viewpoint of nature conservation (Caddell, 2009) and on cultural heritage and representation (Printsmann *et al.*, 2011). Reimann *et al.* (2011) studied the impacts of tourism on nature values and local communities in Estonian national parks. The implications of tourism development in remote protected areas in Estonia need further conceptualisation.

The overwhelming majority of protected areas are located in remote areas. Remote areas with excessive population decline and low population density cover roughly half of Estonia's territory, while accounting for only 10% of the total population and less than 5% of the national GDP. The most geographically remote areas show a steady downward trajectory over decades according to demographic and socioeconomic indicators. The major structural change as well as long-term rural exodus caused the negative cumulative causation cycles (Drudy 1989). Not all shocks have been entirely negative; several restructuring, modernization and diversification initiatives have brought positive development trajectories. The post-productivist approach is associated with strong localism and with empowering communities, the local cultural identity and a renewed sense of confidence. The post-productivist approach also includes less intensive forms of agriculture and the emergence of the countryside as a place of consumption, amenity-rich living and recreational environment (Marsden 1999). Primarily, tourist areas, areas of special interest and seasonal living appear in the category of dynamic remote rural areas. As the number of seasonal rural inhabitants increases by third during summer, second housing and holiday-making in rural locations means extensive weekly commuting off season and has a number of preconditions and restrictions. As depopulation was marginally higher in protected remote areas (–24.1%) than in other remote areas (–22.6%), the employment rate declined there much slower (–3.9%) than in other remote areas (–7.2%). This correlates to the data on new accommodation facilities built in 2004–2013 – the relative increase of units is the highest in protected remote areas or nearby which is 1.5 times higher by totals than in other remote areas (fig 1).

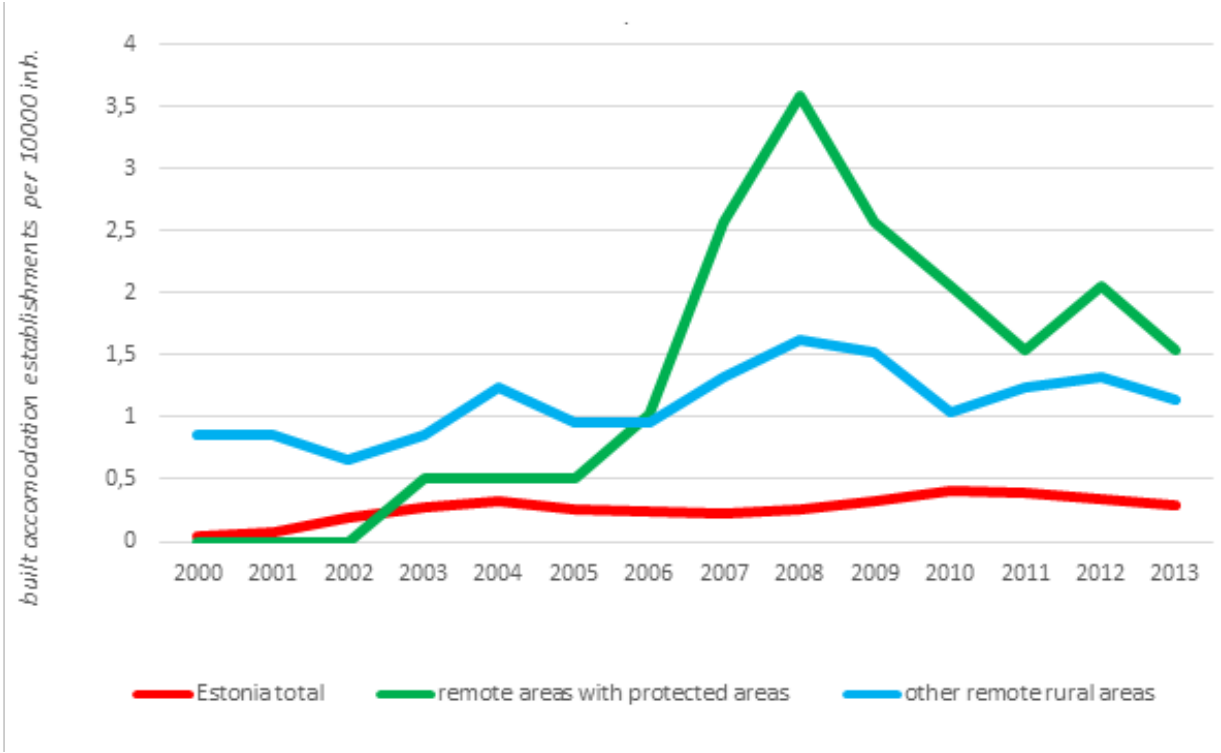

Figure 1. New tourist accommodation facilities per 10000 inhabitants.

Emerging recreational services and tourism have been considered a smooth restructuring platform, although their socioeconomic impact was somewhat over-emphasized. The number of tourist accommodation facilities has increased to a noticeable extent although the occupancy is lagging far behind. Growing interest in tourism entrepreneurship and other streams of rural diversification have not gained momentum for turning negative trends in peripheries. Nevertheless this is not a feature solely of protected areas but remote rural areas in general.

The interests of nature conservation, residents and entrepreneurs are potentially in conflict in protected areas, the latter group having grown alongside societal development, emerging economy, overlapping allocation interests and targeted demand for specific locations. The survey among permanent inhabitants in the Lahemaa National Park (the average age of respondents being 50 years) demonstrated that the attitude towards summer and temporary living varies. Direct beneficiaries such as village shop-keepers take business advantage, while not substantial. On the contrary, a number of issues such as garbage, noise, seasonal supply shortages are listed. Local landlords expect some profit from establishing limited number of seasonal homes in the park. The rapid growth of visitor facilities and visitor volume is opposed, a view, which is dominated by moderate and conservative segment of local community.

Joint-up policy-making and the controversial implications of EU funding

The substantial overlapping of remote areas and protected areas should direct to joint-up solutions for the tourism diversification and protection management. Both municipal governments and protected area authorities tend to set agenda and specific plans for protected areas, aimed at providing jobs and services for local people and trying to avoid marginalisation of the areas, the issues of the possible development models arise.

Unfavourable trends in land use, demography, social welfare, entrepreneurship and education have paradoxically been accelerated after Estonia's EU accession, despite the application of common agricultural, cohesion and regional policies. These policies, having increased productivity in primary sector, have not been able to generate enough new jobs in secondary and tertiary industries, neither the environmental and forestry administration nor EU-co-funded tourism development have substantial measures against deepening peripherisation. The operationalization of current rural diversification and conservation management remains the challenging imperative for EU Common Agricultural Policy. Different development paths could be forecasted for different (types of) protected areas, depending on the demographic and other existing factors, such as distances from larger cities, tourism potential etc.

Theories increasingly account for the diversity found in rural areas (Copus and Hörnström 2011). Endogenous post-structural theories argue that externalities can be complemented by internal territorial capital such as on the one side natural capital and wildlife, on the other side innovation and entrepreneurialism which may attract companies from

outside and generate internal returns. Although Estonian landscape protection has had a notable history, the changing volatile and sensitive socioeconomic scene in remote countryside requires urgently a rethink of the basic principles of nature conservation.

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Biodiversity and tourism – funding instruments for financing measures in favour of biodiversity through tourism

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Introduction

Many tourist regions in Switzerland offer high biodiversity value and wide scenic variety. These values form an important basis for tourism and they are part of the diversity of Switzerland. Biodiversity offers many opportunities for experiences in nature, recreation, and tourism. It is thus of great importance for housing and living space, as well as for the tourism destination Switzerland.

Tourism and its subsectors have in many respects negative impacts on biodiversity, as e.g. through ski tourism or tourism mobility. But also nature sport can result in negative impacts on biodiversity, since those seeking recreation increasingly reach untouched natural areas with their activities. However, tourist use does not only result in negative impacts, and an intact biodiversity is not incompatible with tourism. A major challenge is, however, to find an optimal balance of protection and use between biodiversity and tourism. While literature is usually devoted to the problem of negative effects, positive feedback effects of biodiversity on tourism are rarely appreciated. Nevertheless, many synergies exist (e.g. ecological design of tourism and recreational infrastructure, protected areas as core products of tourism destinations). However, based on the rather one-sided impacts on biodiversity, tourism should have an interest to preserve its basis. One possibility is to support the promotion of biodiversity financially by tourist partners.

The aim of the study was to identify the various funding instruments used by tourism to finance biodiversity, to evaluate these options and, based on that, to propose appropriate funding instruments for Switzerland.

Methods

The study consisted of four steps. The first step included the analysis of interactions between biodiversity and tourism by relating the two fields and their elements to each other, using the method of the influence matrix of Vester (Vester 2007). The empirical basis was a literature and document analysis as well as further research. This resulted in a model visualizing the interdependencies between tourism and biodiversity (see figure below).

In a second step, funding instruments to promote biodiversity through tourism at an international level were identified and assessed relating to their applicability in a Swiss context. The empirical base formed a literature and document analysis and expert interviews with actors from different government institutions and private organisations. This resulted in an overview of existing international instruments, including examples of good practice and a strengths and weakness assessment.

The third step encompassed the evaluation of a selection of specific funding with a range of assessment criteria, developed for this purpose. Similarly, experience with existing instruments in Switzerland to finance biodiversity with respect to tourism was incorporated. Again, expert interviews were the basis for this assessment. The assessment resulted in two funding instruments which would be applicable in the Swiss context and have the potential to increase biodiversity preservation.

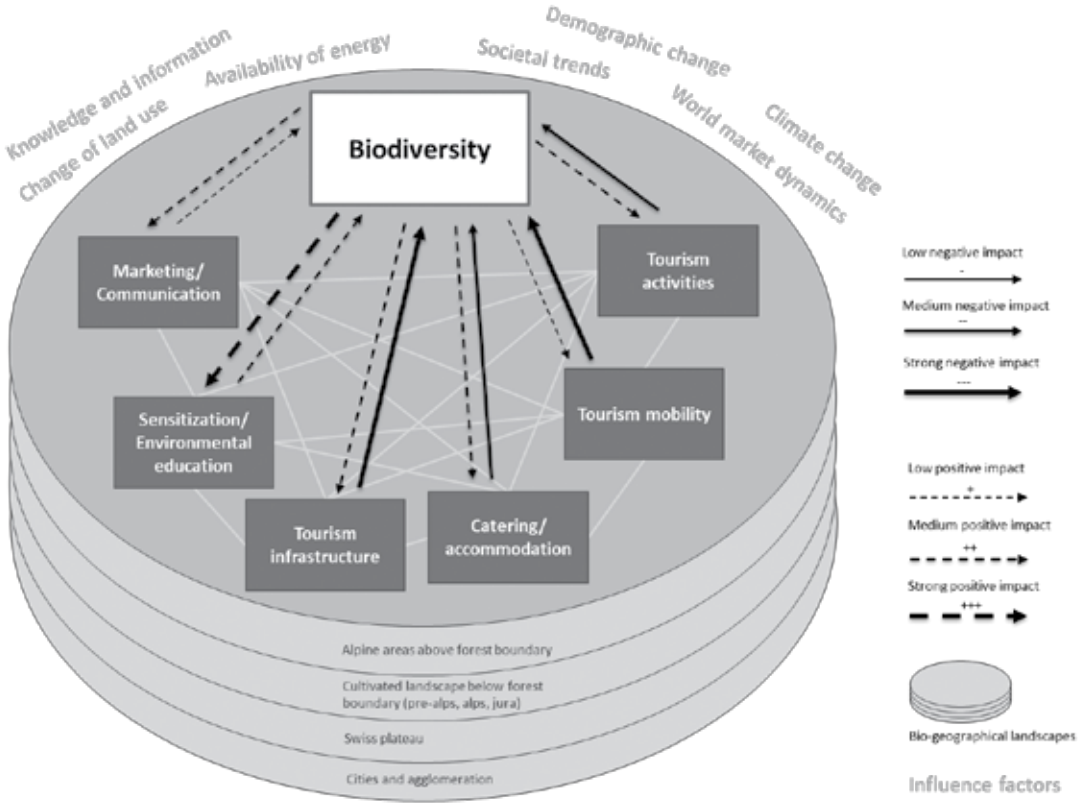
In the fourth step, the two instruments were described in detail and their implementation was elaborated. This process was accompanied by expert interviews and a document analysis.

In addition, a number of recommendations were provided for the consideration of the federal government, the cantons, and the tourism and outdoor-equipment industries to support the implementation of these two funding instruments in Switzerland.

Results

The analysis of interactions between biodiversity and tourism showed that tourism and its elements have a stronger negative impact on biodiversity than vice versa. In contrast, the impact of biodiversity on tourism is in a mostly positive way – an intact biodiversity has an important function for tourism – for nature-based activities or related to nature and landscape marketing. Summing up, tourism should have an interest in making a contribution to the preservation of biodiversity.

Figure: Evaluation of the Interactions between Tourism and Biodiversity



Source: Own illustration

At an international level, a variety of funding instruments exists where tourism contributes to the financing of biodiversity: entrance and user fees, concessions and licenses, sales of products and services, voluntary contributions, and voluntary participation (including the financial contribution of participants) (vgl. Bieling 2009; Buckley 2009; Font *et al*. 2004; Rebanks 2012; WWF 2009). The different legal framework and socio-political context of each country have a strong influence on the implementation of funding instruments. A funding instrument is successful if the financial output contributes as directly and strongly as possible to the on-site preservation of biodiversity. This allows the funding recipient (e.g. a given protected area) to highlight the benefits of a funding instrument directly to its guests. Transparency of the allocation of funds is important for the acceptance of an instrument. Well-functioning funding instruments can also help guests sensitize to the preservation of biodiversity.

Conclusion

Some of the instruments listed and rated have already been implemented in Switzerland (e.g. volunteering) or are difficult to implement (e.g. entrance fees). Therefore, two primary instruments – Biodiversity Swiss Franc and Biodiversity Foundation – were discussed in-depth.

The Biodiversity Swiss Franc instrument consists of a voluntary financial contribution that is made by guests at a particular destination, which is then collected by the tourism organization or by any other regional institution. The revenue is used for the preservation of biodiversity at that destination. The implementation and control of the Biodiversity Swiss Franc should rest with the individual destinations and not be assumed by the federal government or the cantons. However, the federal government and the cantons may contribute to the initial financial aid in the implementation of the Biodiversity Swiss franc.

The Biodiversity Foundation instrument should be implemented in the context of a specific organization. Outdoor-equipment companies provide financial contributions to the foundation. The federal government should be involved in the initial financing of the foundation. The purpose of the foundation is to fund biodiversity preservation projects in Switzerland and abroad. For this reason, transparent criteria need to be in place for the foundation to follow in order to award grants. The idea of a Biodiversity Foundation is primarily to promote biodiversity projects in areas where outdoor tourism is carried out. Projects are not tied to a specific region (e.g. sensitization campaigns could be also considered).

Acknowledgements

The authors wish to kindly thank the Federal Office for the Environment for providing funding for the project 'Biodiversity and Tourism'. In addition, we would like to thank the numerous stakeholders and experts who supported us with their expertise within the project, as well as the project team BiKliTour for the cooperation.

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Effects of experience engineering on regional economy in protected areas

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Derived from profit-oriented types of tourism, attractions also stimulate travel to rural destinations. Therefore, they are vital components of tourism. Without attractions, touristic development of any region often will not be successful. Besides the evident objectives of conservation and development of regional distinctions and indigenous nature, protected areas are an instrument to develop tourism in structurally weak areas and are suited in an optimal way to fulfil the part of an attraction.

Many different phenomena and installations may attract tourists and have boosting effects on touristic development. They belong to three distinct groupings - environmental, historic-cultural and entertainment. Regarding the first of these three pillars, the variety and uniqueness of nature are dominant factors for travel to certain regions. Regarding many travel analyses, reasons, which are directly affected by experiences in and through nature are mentioned most by the German population. “Experience nature” and “fresh air, clean water and non-polluted environment” are examples for these motives.

Protected areas notably offer many possibilities to preserve and develop these natural potentials for advancement of tourism. Not exactly knowing the diverse objectives of different types of protected areas, each of these areas is considered by general public as synonyms for intact nature and protected areas effectively offer perfect conditions to serve the motives mentioned above.

Natural attractiveness of protected areas is a touristic pull-factor, which obviously generates effects on regional economies. These effects have become more and more object of investigation of economic analysis of nature-based tourism.

Experience engineering is an appropriate tool to manifest and manage these economic effects. From an activity-oriented view, hiking generates one out of the five biggest business volumes and seems to be feasible in nearly every rural area. In addition, hiking is an activity large parts of the population are able to pursue. Therefore, hiking-oriented experience engineering promises validation of touristic impact in structurally weak areas.

Visitor interviews are currently the most used academic method of analysing installations for experience engineering and its economic impacts. Figure 1 indicates the importance of diverse items mentioned by hikers in “Natur- und Geopark TERRA.vita” and “Naturpark Teutoburger Wald”.

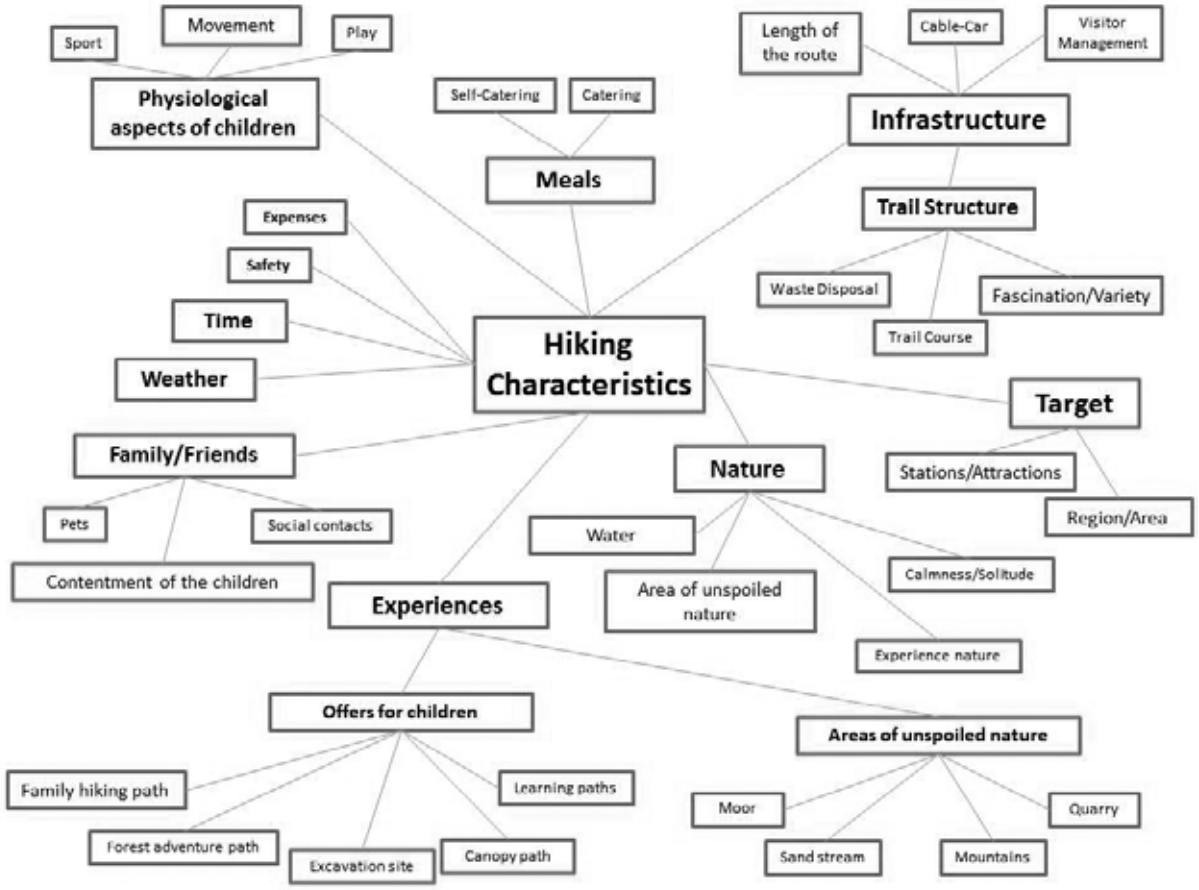

Figure 1: categories of hiking characteristics (own diagram following Judt, 2014)

Following expectations expressed by their tourists, the management of protected areas will generate more consumer satisfaction and consumer loyalty.

Besides visitor interviews, visual-based methods can give information about the fulfilment of experience engineering installations as attractions. Objects of investigation of visual-based methods are tourist cognition and perception towards natural attributes during their stay in a protected area. Perceptions and cognitions differ among unequal types of tourists. Different perceptions and cognitions of especially hikers, runners and mountain bikers can be identified by using methods which concern the visual impressions of each group.

These differences can be identified by using the analyses method of participating observation. This kind of observation allows researchers to identify behaviour of different types of tourists attending attractions.

The knowledge of dissimilar tourist behaviour allows further analyses. The interconnection of the output of visitor interviews and the output of participating observation will identify the impact of different tourist behaviour among dissimilar types of tourists on regional economy based on it. Investigating different kinds of protected areas, diverse tourists can be considered and more detailed conclusions of effectiveness of touristic installations can be drawn and the effectiveness of experience engineering in protected areas can be accurately analysed. In addition, identified and differentiated economic effects resulting from dissimilar tourist behaviour offer a variety of possibilities for the management of protected areas to consider the needs of target groups for the process of managing outdoor recreation and product development.

SESSION 5A VISITOR MONITORING BENEFITS

Methodological challenges in nature-based tourism surveys – the use of self-registration cards in Swedish mountain areas

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Introduction

Common difficulties with nature-based tourism surveys include challenges in locating visitors' post-experience, as well as challenges in administering reliable surveys post-visit. In this study, self-registration cards are used to address these difficulties in a case study of Södra Jämtlandsfjällen (the southern Jämtland mountain area, Sweden). Visitors are asked to fill out a card with their contact information and thus agree to be contacted by email to participate in a web-based questionnaire. The utility of the self-registration card approach, as well as the method of web-based questionnaires, is analysed and discussed in this study.

Soundscapes

To experience peace and quiet is increasingly difficult in today's society. Not surprisingly, studies in the field of outdoor recreation reflect this trend. For example, in North American national parks and wilderness areas noise is becoming an increasing problem, according to both research and management (Mace *et al.*, 2004) where the *soundscape* (consisting of natural and non-natural sounds) is a resource to be protected (Rossman, 2004). To experience natural sounds is obviously a valuable product in tourism, but is also important in outdoor recreation. Noise thereby illustrates one example of a conflict if motorized recreation activities are allowed in areas where natural sounds are sought by other recreational groups. Moreover, it is found that in order to understand and to handle conflicts of noise and natural quiet, it is important with information of the visitors' attitudes (see e.g. Pilcher *et al.*, 2009).

Motorized Activities and Visitors' Attitudes in a Swedish Context

Issues of reducing noise pollution and protecting natural soundscapes has been discussed in Sweden since the 1980's. The Swedish National Board of Housing, Building and Planning (2003) claims that the level of unwanted sounds is increasing in Sweden while areas with natural sounds of quality are diminishing. The possibility to experience natural sounds and reduce noise varies in protected areas and e.g. in different parts of the Swedish mountains. In the national environmental goal *A Magnificent Mountain Landscape* (16 environmental quality objectives describe the state of the Swedish environment which environmental action is to result in; these are to be met within one generation, i.e. by 2020), noise is defined as a management issue. This concerns several stakeholders, where the values for outdoor recreation are to be defended and maintained, and the influence of noise is minimized.

One defined source of noise (as well as smell and pollution) is the snowmobiles. In the past 25 years, the usage of snowmobiles in the Swedish mountains has increased. Snowmobiles are used when transporting goods and supplies to peripheral areas of the mountains, as well as a mean by the Sami. Snowmobiles have also become part of the tourism development in these areas. There are several opportunities to rent a snowmobile or to participate in safaris. The motorized activities are thereby in different contexts; work and fun. In order to understand who the primary stakeholders are and if there are any conflicts of noise connected to motorized activities, as well as what management strategies would be the most effective for managing soundscapes, it is relevant to get information directly from the users of the area.

The Study

This study is part of a project in the research programme *A magnificent mountain landscape for future generations*. It is a research initiative by the Swedish EPA in order to encourage a holistic view of the mountain landscape based on close collaboration between relevant stakeholders. The aim is to create a deeper understanding of the mountain world conflicts and opportunities with respect of different perspectives to promote sustainable development. Thereby, the conflict of noise in the mountain region of Jämtland-Härjedalen, Sweden is investigated. In-depth qualitative interviews with visitors, second home owners and authorities in the counties Härjedalen and Jämtland will be carried out during fall 2014 and spring 2015. Also, field observations will be conducted to document and analyse norms, values, and interpretation as well as communication patterns of stakeholders i.e. an attempt to see the reality from the stakeholders' perspective. The above-described qualitative methods are preceded by a web-based questionnaire directed to visitors in spring 2014. Thereby, two

stakeholder groups have been identified – skiers and snowmobilers – to be included in the survey.

However, this raises the question how the skiers and snowmobilers will be contacted and reached (Kajala *et al*., 2007). In Sweden, self-registration cards are one of the few ways to obtain addresses of future respondents of a questionnaire survey. In this study, self-registration cards are one method used for an initial visitor monitoring in the mountain area of Jämtland-Härjedalen. The cards themselves are a method for collecting visitor data concerning name, e-mail addresses, age and sex, and information of the number of days visiting the area. Additionally, there are two questions regarding the experience of noise and the attitudes to regulations of snow-mobiles in the Swedish mountains to achieve natural quiet. Five STF (*Svenska Turistföreningen*) mountain stations were selected for the distribution of self-registration cards in March-April 2014. In addition, cards were handed out at certain gate-ways in the area by field workers. Finally, different local associations for snowmobiles were contacted.

What are the advantages and disadvantages with the data collection procedure and the gathered data? How can the procedure with self-registration cards be further developed? Different problems and biases are identified and discussed in this study with comparisons to earlier studies and methodological discussions (see Ankre & Wall Reinius, 2010). There are several aspects to consider such as finances, other organizations and their interest to participate, geographic distance, number of visitors in the research area etc. Moreover, questionnaires are an appropriate sampling strategy since it captures many stakeholders' opinions and attitudes where the results may be compared to earlier studies. However, what are the future challenges with web-based questionnaires within visitor monitoring? For example, it can be difficult to stand out in a flow of various web-based questionnaires from different sources.

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More than ten years of visitor monitoring in Estonian state forests

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Introduction

Almost a half (2.2 million hectares) of Estonian land is covered with forest. The State Forest Management Centre (SFMC) is the agency responsible for the management of about a half of the total forested area in Estonia. In addition to forest regeneration, silvicultural activities and timber production, SFMC has also been responsible for the systematic development of diverse opportunities for outdoor activities in recreational areas in state forests since 1997. SFMC has chosen, developed and designed 13 recreation areas across the country. As of February 2009 SFMC is also dealing with visitor management in 5 national parks and 40 other protected areas. In addition to creating and planning recreation opportunities in SFMC's recreation areas and protected areas, SFMC is providing information about those opportunities and is organizing environmental education activity in SFMC`s nature centres and nature houses.

The goal of the SFMC's Nature Management operation area is to contribute with its activities to growing awareness and sustaining of nature among and by the population, and thereby reduce the impacts involved in the use of nature on the ecosystem, improving people's health and providing satisfaction through the possibility of nature recreation based on everyman's right in recreation areas and protected areas.

Visitor management

According to SFMC visitor monitoring data, participation in outdoor recreation activities has increased in the last decade, it is important that visitor management is dealt with in a complex way. There are three important components of visitor management in SFMC:

PLACE – planning, establishing and managing recreational landscapes (monitoring of social and ecological aspects, surveys, management plans, general plans and designs, building the infrastructure, maintaining the infrastructure, landscape protection activities)

INFORMATION – informing the general public of recreation opportunities (directing information in the landscape, information desks, home page, publications, events, campaigns in the media)

ATTITUDE – shaping sustainable attitudes to land use (nature study programs, permanent exhibitions, competitions)

To improve the visitor management and measure the successfulness of the visitor management activities there are indicators and annual target values set in SFMC development plan. In the SFMC development plan 2010-2014 (State…, 2010) the indicators related to outdoor recreation are:

- number of graduates of SFMC's nature education programs
- number of different nature education programs
- number of forest visits in SFMC recreational and protected areas
- number of people receiving information from SFMC on gathering areas for berries and - mushrooms
- customer satisfaction
- carrying capacity of ecosystems

Visitor monitoring

Cooperation has been an important part in the development of the visitor management and monitoring system in Estonia. As a Nordic-Baltic cooperation in 2007 the manual "Visitor monitoring in nature areas" (Kajala *et al*. 2007) was released. In 2008 SFMC published the manual in Estonian. SFMC has been using an on-site guided visitor survey method and automatic visitor counting methods described in the manual since 2002.

In April 2009 SFMC took into use the application KÜSI for entering and processing visitor information. The application, which was specially developed for Metsähallitus from Finland the user interface was translated to Estonian and a few customisations were made to the application to meet the needs of SFMC.

To ensure the achievement of the goals, make future management and funding decisions several visitor monitoring methods are applied:

Visitor surveys

The visitor survey has been carried out on all recreational areas of SFMC to establish the motivation, preferences and needs of visitors in recreational areas and to determine whether the developed facilities meet the expectations of the users. There have been visitor surveys in 2002, 2003, 2006 and 2010. Visitor surveys have been carried out in the same year and they are carried out on the same basis.

The 2002, 2003 and 2006 visitor surveys were carried out on all recreation areas. The 2010 visitor survey was carried out simultaneously on 13 recreation area, five national parks and 7 other recreation areas with significant infrastructure. In total 6893 filled survey questionnaires were obtained.

Since the 2003 and 2006 visitor surveys showed that people are not aware of the opportunities provided by SFMC, several actions have been taken since to increase the awareness. Information desks around Estonia were opened, the recreation objects got style changes to look more uniform so the visitors would be more aware that they are visiting SFMC recreation objects, events were organized. In 2012 a more user friendly website was launched and since 2013 it is available in Estonian, Russian and English. Also there is a mobile application for finding outdoor recreation possibilities.

Visitor counting

Visitor counting is continuously conducted in all SFMC recreational areas since 2002. In 2009 SFMC installed first counters also on protected areas. In 2013 there were a hundred and twenty electronic counters installed in SFMC recreational areas and protected areas. The installation of counters, taking counter readings, the maintenance, calibration of counters and extrapolating the point counting results is done as described in the manual "Visitor monitoring in nature areas" (Kajala *et al*. 2007).

Nationwide recreation studies

The primary objective of the nationwide recreation studies is to find out the level of awareness of Estonian residents concerning the opportunities developed by SFMC for the outdoor recreation activities and the level of the demand for and use of offered opportunities. Since the nationwide studies involve also the non-visitors of the SFMC recreation sites they are an important addition to the on-site visitor surveys. The study has been conducted by the Survey Research Centre Faktum in 2003, 2006 and 2009. The 2012 study was carried out by Turu-uuringute AS.

In 2006 SFMC ordered from the Survey Research Centre Turu-uuringute AS a survey to find out the attitude of people living close to 5 most problematic recreation areas towards recreation opportunities provided by SFMC.

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Towards an effective visitor monitoring strategy for the Tatra National Park, Poland – a management perspective

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Introduction

The Tatra National Park (TPN) is one of the most heavily used National Parks in Poland. It attracts approximately three million visits annually (Czochanski & Borowiak, 2000). High visitation numbers, especially in the summer season are a great challenge for the National Park management (Zwijacz-Kozica, 2007). As the area belongs to the IUCN management category II, its primary objective is to protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation (Dudley, 2008).

The Tatra National Park has already a well-established monitoring program of fauna and flora, however in order to better understand the overall conditions in the area, there is still a need for more comprehensive information about the visitors. The park management aims to develop an effective visitor monitoring strategy and therefore in 2013 initiated a pilot project to operationalise that goal. The objective of this paper is to show the management perspective on visitor monitoring and to present the process of concept development gathered during the one-year pilot project.

Study Area

The Tatra Mountains are situated in Central Eastern Europe and are the highest range within the Carpathian Mountains. The elevation ranges from 900 to 2 655 m above sea level (Mirek *et al*. 1996). The total area of the mountain range comprises 750km2, of which three quarters belong to Slovakia and one quarter to Poland (Mirek *et al*. 1996). Almost the entire area lies within the borders of two independently managed national parks: Tatransko Narodny Park in Slovakia and Tatrzanski Park Narodowy in Poland. This paper focuses on the Polish park.

Methodological Approach

In order to re-think the existing visitor monitoring in the Tatra National Park and to develop a new concept of gathering and utilizing data on NP visitors a working group composed of practitioners and researchers from several disciplines has been established. Figure 1 gives an overview of the planned activities leading to the final concept of visitor monitoring.

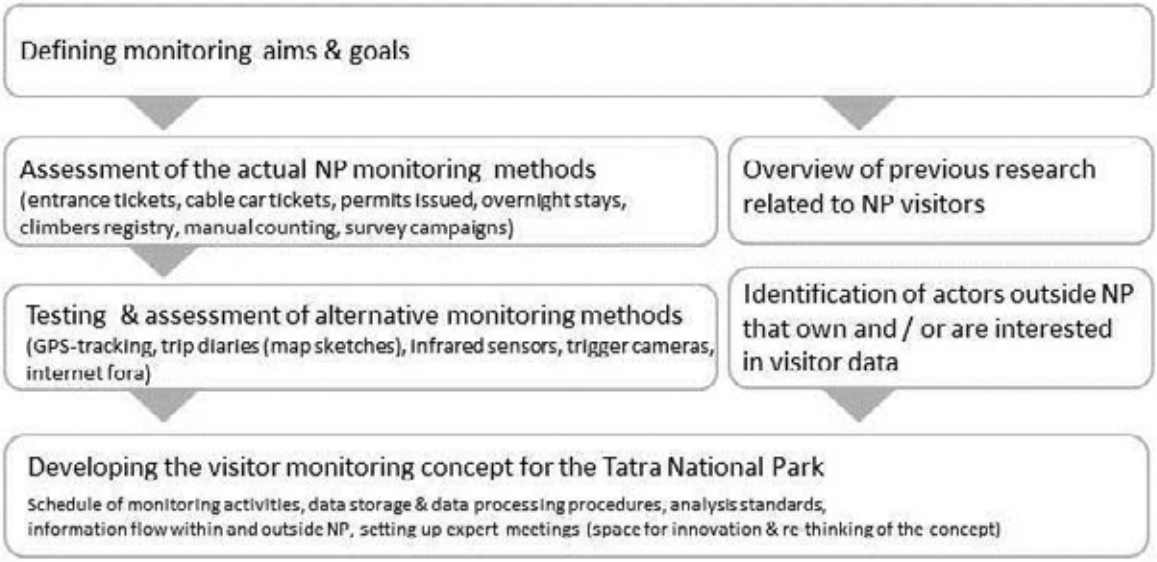

Figure 1. Overview of the process leading to the development of the new visitor monitoring concept for the Tatra National Park, Poland

A discussion of the monitoring goals was the starting point to the whole process. The NP is interested in general information on the visitors' spatio-temporal distribution as well as socio-demographic characteristics of different activity groups. Two major target groups of visitors have been identified at this stage: mass tourists and qualified visitors. This differentiation was very supportive while forming hypotheses on visitor behaviour, related natural and social conflicts as well as selecting relevant monitoring methods to study those contrasting visitor groups.

Further, the actually used monitoring methods in the NP have been assessed regarding their utility for NP management, efficiency and related costs. Records of sold entrance tickets have been reported to be the most expensive, but at the same time the most reliable method delivering information on visitor numbers at particular entry gates to the National Park through the whole year.

During the pilot project several additional monitoring methods have been applied in selected NP areas. In the summer season 2013 14 infrared sensors (Eco-counter), 10 trigger cameras were tested in the Czerwone Wierchy massif. Additionally, a survey campaign (structured questionnaires combined with analogue trip diaries) took place in Czerwone Wierchy (N=2106) and Kasprowy Wierch (N= 8051) areas. In the summer season 2014 GPS-tracking of cable-car users is planned. The newly used monitoring methods will be assessed and considered for the development of the visitor monitoring concept for the Tatra National Park.

Additionally, the actors outside the National Park that own and / or are interested in visitor data will be encouraged to actively to join the visitor monitoring campaign.

Conclusions

The authors of this paper believe that re-design of the actual visitor monitoring strategy will be the first step towards gathering reliable and systematic data supporting further management decisions. The visitor monitoring concept will consist of a detailed schedule of monitoring activities, data storage and data processing procedures, analysis of standards, information flow within and outside the NP. Setting up regular expert meetings and/or participation of the NP staff in related events such as MMV-conference will be an important tool allowing adapting the concept and making place for innovative solutions.

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Monitoring attitudes to nature-based tourism: a case study of Japan's national parks

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Introduction

Japan's original National Parks Act (1931) was expanded in 1957 to the Nature Parks Law, with jurisdiction over national, quasi-national and prefectural nature parks. This hierarchical three-tiered system has survived subsequent amendments, and national parks still represent the strictest level of conservation while functioning as a platform for tourism and regional development. The number of annual visits to them rose rapidly in the 1950s and 60s when rapid economic growth and urbanization brought construction of new bullet-trains, highways and other access infrastructure along with widespread car ownership. Although numbers stagnated in the 1970s, the 80s saw further growth. Visitation peaked at 415 million in 1991, before declining to 309 million in 2011.

Research design

Research objective and key terms

The recent decline in visitation has direct implications for national park management and reflects indirectly on society's changing relationship with nature. Yet academic research remains focused on congestion at certain honeypots without addressing the downturn. This study aims to explore broader attitudes to nature-based tourism, characterized by its location in natural destinations, in order to unpackage the downturn in visitation to Japan's national parks. Empirical evidence is used to identify potential cause factors for the decline in visitation via a two-pronged approach consisting of i) overall affinity for nature and awareness of national parks; and ii) willingness to visit parks.

Selection of data

The data set in Fig.1 consists of Ministry of Environment (MOE-J) records of national park visit numbers from 1950-2011. Although this data relies on an eclectic mix based on accommodation and visitor centre indicators, the estimate still provides a benchmark of macro trends. Furthermore, these findings can be supplemented with evidence from opinion polls that monitor attitudes to national parks and nature-based tourism. The second data set thus draws upon the results of one such survey that was conducted at national level by the Cabinet Office in August 2013 (COGOJ, 2013). A total of 3000 survey packs were distributed and 1,842 questionnaires were returned, a rate of 61% , which easily exceeded the minimum requirement of 350 forms needed at error of ±5%.

Findings

Affinity for nature and awareness of national parks

83% of all respondents claimed to feel interested in nature, including 40% who were "interested" and 44% "somewhat interested." Less than 5% were "disinterested" in nature, although this proportion with age up to a maximum 7% among respondents aged 70 and over. Among the youngest group aged below 30, only 24% were sure about their interest in nature, whereas a combined 19% were "somewhat disinterested" or "disinterested" in it. Among different models of protected areas, respondents' level of awareness of national parks (90%) outranked others such as UNESCO world heritage sites (85%), quasi-national (64%) and prefectural nature parks (48%).

Willingness to visit national parks

Despite high levels of awareness and stated affinity for nature, only 47% of respondents chose to visit a national park among other protected areas, compared to 70% who wanted to visit a world heritage site (multiple answers were allowed). When asked directly, a combined 85% did want to visit a national park, but in younger age groups, the reported "disinterest" in nature translated into less willingness to visit national parks, with fewer than half (47%) eager to visit compared to a median of 62%. The youngsters' lack of desire to visit national parks was even lower than the 70+ group (56%) at the other end of the age scale, where physical barriers are a significant impediment.

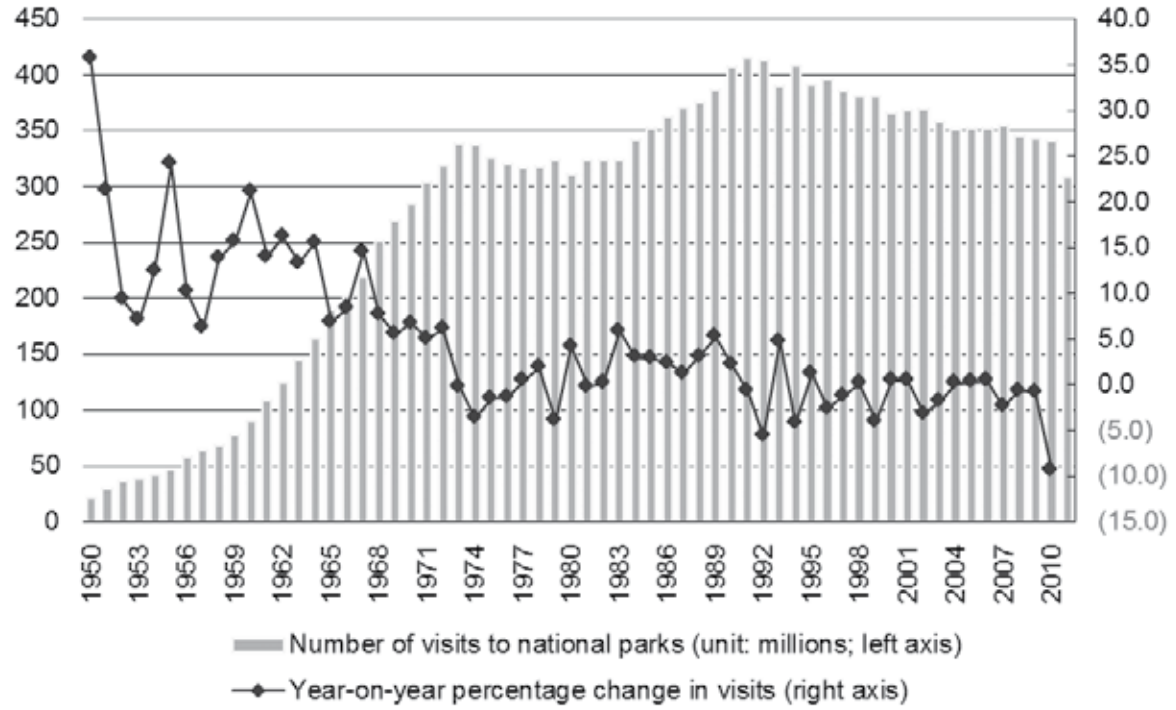

Figure 1. Annual visits to Japan's nature parks 1950-2011 (Source: MOE-J, 2013)

Discussion

This research combines MOE-J national park visit data from 1950-2011 with a COGOJ opinion poll monitoring attitudes to national parks and nature-based tourism. Results show the number of annual visits had declined by over 25% in 2011 compared to the peak in 1991. Thus demand for nature-based tourism seems to be shrinking, and despite high levels of awareness and stated affinity for nature, visiting national parks is a less popular choice than other protected areas such as world heritage sites. The desire to visit national parks was especially low among younger age groups, with fewer in this demographic interested in nature. More research is needed to contextualize this finding and identify potential counterstrategies to attract younger visitors. Also, other possible factors should be acknowledged including changes in the demand structure with diversification away from large-scale bus tours in favour of smaller groups or individual travel, with an increase in special interest tours (SITs), ecotourism and green (agro) tourism (Katō, 2008).

These findings should be treated with caution due to limitations in coverage, with younger people potentially underrepresented in the opinion poll – this could be rectified in future studies by offering an on-line version. Although this kind of macro study necessarily entails a degree of generalization and stated preferences can be unreliable, monitoring national trends in visitor demand and attitudes to nature-based tourism is a crucial step for park management. The case study of Japan's national parks has both practical and methodological implications for protected area planning and marketing.

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Manipulation of tourism traffic system in an important wild reindeer migration route in Norway

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Background

Wild mountain reindeer (*Rangifer tarandus tarandus*) (or caribou in North America) is the most widespread and abundant large herbivore in tundra ecosystems. Economically, culturally, and socially, the species has contributed through millennia to shaping rural mountain cultures and boreal regions. Contemporary developments in rural areas, and increasing pressure and piecemeal fragmentation of reindeer habitats, have led to international recognition of the species' vulnerability. Greater interest and awareness of the role of reindeer in arctic and alpine ecosystems, combined with rural communities' needs for economic development, have led to calls for a change in the existing management system with greater involvement of stakeholders (Kaltenborn *et al*., 2014). The daily management of the wild reindeer areas is carried out in cooperation between the private and public sectors. The main responsibility for day-to-day operation is attended to by a landowners' body, usually called the wild reindeer committee, while the state-run wild reindeer board exercises public authority. When a gravel road used in a former military shooting range at the Dovrefjell mountain plateau in Norway where decided to be removed and restored back to nature, the local stakeholder advocates to keep the road for local development and tourism. The source of conflict is a tourist cabin (Snøheim) situated in the end of the 13-kilometre road, located in the Dovrefjell-Sunndalsfjella national park (Figure 1). In all, 5800 tourists overstay in the 2013 summer season, and most of the tourist walked to the top of the mountain Snøhetta (2287 m.a.s.l). The main challenge to keep this road is that the wild reindeer herd in the area had to cross over the road as a part of their seasonal migration in the period of August to October, which coincide with the last part of the high season for tourism in this area and the start of the hunting season (starts August 20th) for wild reindeer. A central question was how to combine the use of the road with the migration route of wild reindeer?

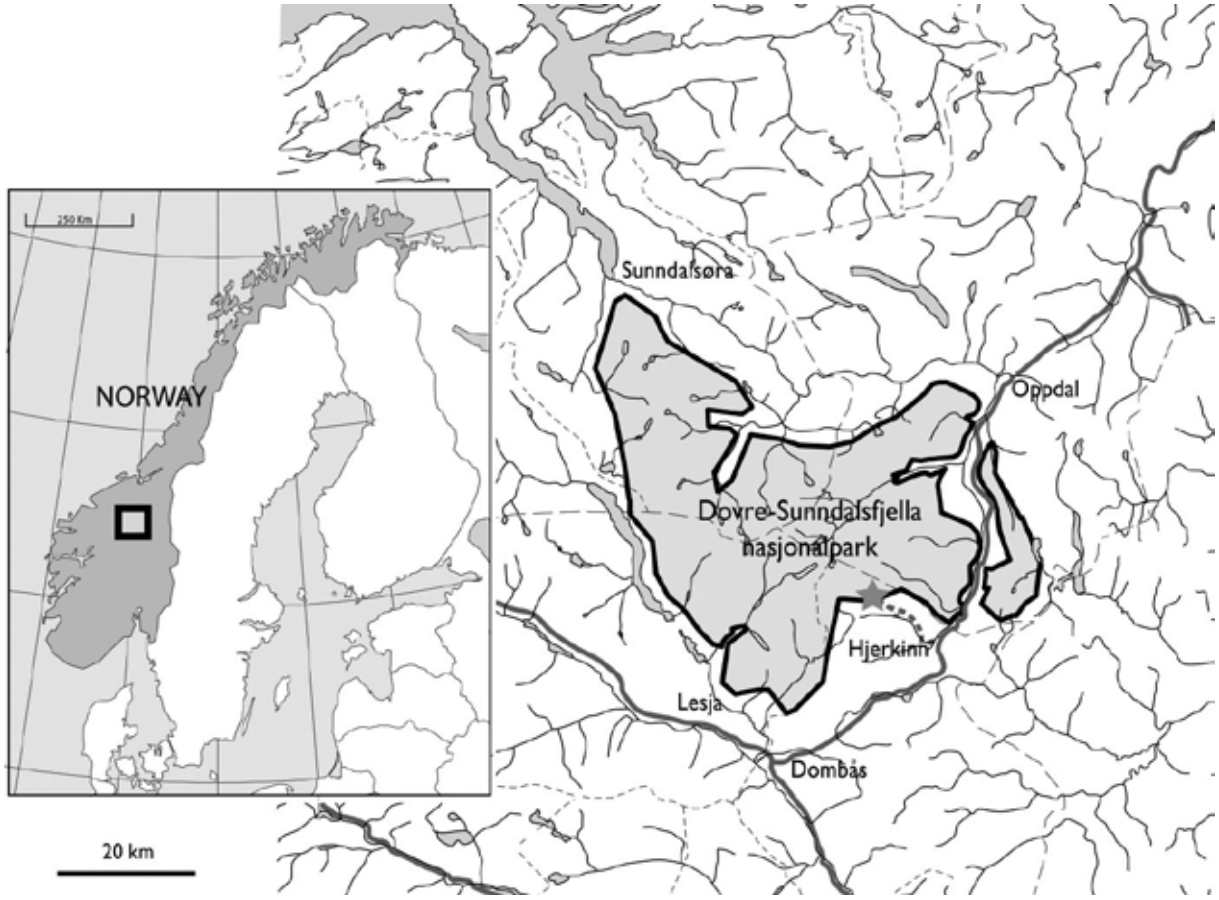

Figure 1. The study area. The boarder of Dovre-Sunndalsfjella national park is shown as black solid line, and the gravel road from Hjerkinn (shown as grey dots) to the tourist cabin Snøheim (marked with orange star).

The experiment

In cooperation with the local authorities and the wild reindeer management board for Snøhetta management area, we carried out a four-years experiment, including two different regimes of the use of the road: In 2010 and 2011 there was access for all to drive along the road with private cars and in 2012 and 2013 we closed the access for private cars to the road, and introduced a shuttle bus with five departures daily. Our aim with the experiment was to monitor the changes in the use of the area, from a private car regime to a shuttle bus regime. We used different methods to monitor changes; Automatic counters with pyroelectric sensors that detect the heat radiation emitted by human bodies were placed out at all marked paths in the area (n=14). For details and concerns about this method, see Andersen *et al*. (2014). A trail use index (TUI) for each counter location was calculated as the average number of registrations per hour $\frac{(\Sigma \text{ counter recordings per day})}{(12 \text{ hours})}$ between June 15th to October 1st. A low season was defined from June 15th –July 7th, a high season from July 8th - August 7th, a hunting season from Aug 20 th - Sept 20 th. Based on the time-distribution of the recordings, we used 12 hours (08:00 am – 08:00 pm) as the daily activity timespan and categorized the trail use by the intensity of use (Range: <1 to > 30 persons per hour) and season. We also used GPS tracking of people by handing out GPS loggers (model: Trackstick, logging a GPS location every 5 sec.) to visitors entering the area at the starting point of the road to Snøheim (n=976 trips). Data from the GPS loggers was collected in a national database (www.dyreposisjoner.no) to secure them for public access in the future (Gundersen *et al*., 2013b) and to easy relate these data to an on-going study of wild reindeer movements and response to human activity. Reindeer locations (and also human activity, measured by GPS loggers) were analysed by using kernel density estimates to identify areas conflicting between wild reindeer and recreational use. In addition, we used statistics from different sources describing activity including tickets, fees, and overnight stay at cabins on the area (Gundersen *et al*., 2013a). In this part of Snøhetta, 17 wild reindeer were GPS tracked during 2009-2011, and 6 in 2012. Altogether 14 GPS collared wild reindeer crossing over the road 223 times during the four-year period. The results show that both the spatial pattern of recreational use and the intensity of use changed substantially during the experiment, from being scattered and intensively conflicting the migration route, to be displaced to the end of the road and not conflicting the migration route. The data from GPS collared wild reindeer herds show that the migration route has been functional the whole period, but TUI levels of more than 20 persons per hour act like a human barrier in the landscape to wild reindeer. Ecologically, it is far too early to conclude how these changes will affect the wild reindeer migration in the long term. The project will continue to monitor the human use of the migration route.

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Monitoring for tourism cluster in the Gauja National Park, Latvia

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Introduction

The goal of this report is to elaborate monitoring system for Tourism cluster members in the Gauja National Park, Latvia. The report is based on the case study of the Gauja National Park Tourism cluster in Latvia. The beneficiary institution of the research outcome is the non-governmental organisation "Gauja National Park Tourism Society".

The used methodology for the elaboration of Tourism monitoring system is a content study method, statistical data, case studies of several questionnaire forms of visitors in national parks and 16 interviews with experts in this field. I also applied my previous experience in two projects of integrated monitoring system in North-Vidzeme Biosphere Reserve, Latvia and I adapted the best experience from other elaborated visitor monitorings in different studies for carrying-out Tourism monitoring of the Gauja National Park Tourism cluster.

The novelty of this research is the established Tourism monitoring system for Gauja National Park Tourism cluster. The main difference from other visitor monitoring systems in national parks is the management organisation, which in the case of the Gauja National Park Tourism cluster is the non-governmental organisation with around 55 to 60 members. Nature Conservation Agency of Latvia is the only one of all members with the same impact. The Gauja National Park Tourism cluster involves many private companies, which operate in tourism market. At the same time, The Gauja National Park Tourism cluster has limited number of staff, only two persons.

Till now they have not one unified Tourism monitoring system for all Gauja National Park Tourism cluster members. The elaborated monitoring system will be a tool for stakeholders to make decisions about new markets, new products, services, quality and seasonality on the basis of tourism monitoring results.

Theoretical aspects

Understanding about a monitoring system is crucial. Eagle gives precisely the description of monitoring that it is a systematic and periodic measurement of indicators of biophysical and social conditions (Eagle *et al*, 2002, PP.151). Eagle has noted two significant aspects for tourism monitoring, particularly in protected areas: visitor impacts and service quality. Hadweb states that it is important to build an optimized monitoring approach through careful indicator selection and through clever implementation of monitoring schedules (Hadweb *et al*, 2013). Many authors have written about significance of monitoring on time, which means to carry out monitoring before the sites are damaged. Financial resource cutting of national park management organisations has been done in several countries, for instance, the US, Canada and Latvia in at least last three to five years. From this point of view, managers of protected areas (PA) are interested to attract more visitors for reporting for governmental institutions about their significant role in society and on the other hand it provides more income for PAs. Gauja National Park is located in a populated area where are strong tourism traditions and local municipalities would like to attract more visitors during all year around. In case, when the goal of PA and local municipalities is to increase number of visitors in the area, tourism monitoring system became more important than before.

Overview of the case

In 2012 the Gauja National Park established a long-term cooperation tourism cluster, which involves 60 stakeholders: owners of tourism objects and tourism service providers as private, public and educational/research institutions. The Gauja NP tourism cluster has a goal to create the Gauja NP as a tourism destination with well-known brand "Enter Gauja" and to be innovative in tourism service offers for specific target groups. The tourism cluster focuses on strengthening of national park in marketing campaigns to attract visitors to tourism objects and services inside and in corridors to national park.

The long-term goal of the Gauja NP tourism cluster is to increase the number of visitors in export markets and domestic market. Therefore indicators are significant to measure achievements of Tourism cluster.

The Gauja NP Tourism cluster wants to offer more tourism services and to attract more visitors for longer visits in the park. However, it is important to find balance between the offer and demand; income and nature conservation or by simplifying, it will be about the capacity of resources and the number of visitors. The institutional form of the Gauja NP Tourism cluster is a non-governmental organisation that is running European Union funded project to develop tourism in the Gauja NP. Therefore my project is elaborated according to needs of the Gauja NP Tourism cluster project. One of the work packages of the project is to create Tourism monitoring system of the Gauja National Park Tourism cluster.

Proposed monitoring for Tourism Cluster

Researcher Hadweb W. of recreation ecology explains the main reasons of visitor management necessity in protected areas (PA) in the article (2007). He and other authors (Eagle, Cessford, Livina) have emphasised the increasing number of visitors in protected areas, particularly in National Parks (NP) in the world; the rise of tourism services and products in protected areas by private sector and administrations of PA; the capacity of most popular or icon sites; in some countries monitoring of protected areas is included in legislation. The next discussed issue according to Hadweb is what we need to monitor or what we need to know of our visitors in NP. During the talk with well-known researcher of tourism in PA P.Eagle (Canada), he mentioned that the first significant step is to understand the purpose of tourism monitoring in NP, the second advice was to keep it as simple as possible (2012).

Visitor monitoring in the Gauja National Park Tourism cluster consists of four themes: economic development value, market research, service quality and sustainability. Each theme includes various indicators with sub-indicators. The number of indicators and sub-indicators for each theme vary on the basis of significance and amount of prevalence particularly in the Gauja National Park Tourism cluster and rules of the European Union financed project guidelines.

Below I show you the chosen indicators for each theme. All indicators are selected carefully by significance for the Gauja National Park Tourism cluster, taking into account recommendations of other similar researches in the world. The last rule was to keep visitor-monitoring system as simple as possible for the data collection and analyses.

Economic Development value theme includes six main indicators with sub-indicators. Each company or Tourism information centre, which is a member of Tourism cluster provides necessary data of indicators in specific working sheets (protocols):

1.1.Visitor dynamics in Tourism Information Centres/Points, Number of visitors of municipality tourism website
1.2.Number of overnights, occupation rate
1.3.Number of visits in tourism objects
1.4.Main data by Central Statistical Bureau
1.5.Turnover of companies
1.6.Employment of companies. The average number of employees per year.

Research of the market:

2.1.Benchmarking of supply in the Gauja National Park Tourism cluster
2.2.Survey of foreign visitors every year. (Satisfaction after visiting Gauja National park, including expectations, NET promoter score, spatial data of entrance and exit of the park)
2.3.Dynamics of products of value chain (Regular overview of cooperation among companies to offer tourism services).

Quality:

3.1.Review of clients (as it is done for trip advisor, booking.com). Analyses of reviews twice per year.
3.2.Quality of provided tourism services
3.3.Nature Trails includes several parameters of trails, as well as type of trail.

Sustainability:

4.1.Sustainability of nature environment. How to measure the use of nature resources. (Rural bird index, number of companies which support biodiversity, cultural heritage, traditions)
4.2.Sustainability of social environment. Social environment sustainability in the context of Tourism in the Gauja National Park (Satisfaction of population to take part in tourism planning, number of visitors on 100 populations, willingness to change living place)
4.3.Survey of inhabitants once every two years.

Conclusions

The Tourism monitoring is created in four themes. Each theme of the monitoring consists of several indicators and in two cases is proposed to carry out qualitative data from foreign and residential surveys in the Gauja National Park. The created monitoring system will be at first discussed with stakeholders of the Gauja National Park Tourism cluster and then started to implement in the Gauja National Park Tourism cluster in 2014.

The most complicated part of this tourism monitoring system is the data collection and management because it involves around 60 different stakeholders by size of company, by interest in tourism, by capacity and social responsibility of nature values.

Acknowledgment

This research was carried out in the project "Development of the Gauja National Park Tourism cluster" supported by the European Union, European Regional Development Fund, Investment and Development Agency of Latvia.

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SESSION 5B TRENDS IN OUTDOOR RECREATION

Recreation trends and sustainable development in the context of the environmental objective "A magnificent mountain landscape"

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This paper provides preliminary results from a national survey on recreation in the Swedish mountain region. The survey is part of a larger study on recreation trends and sustainable development in the context of the national environmental objective "A Magnificent Mountain Landscape" (En storslagen fjällmiljö).

The Swedish mountain region is an attractive recreation landscape and tourism is an increasingly important use of the area. Previous research has shown that almost half the Swedish adult population visits the mountain region during a five-year period and about 5% of visitors are from outside Scandinavia (Heberlein *et al.*, 2002). The tourism industry is growing in many mountain areas and has become an important development issue including stimulus for related industries and increased government revenues. Although tourism may be attractive as a means of economic development, its social and environmental impacts on local communities can be a serious concern. More recently, there are indications of significant changing recreation behaviours, not the least in typical mountain activities (Odden, 2008; Sandell *et al.*, 2011) and the impacts from these are largely unknown. In order to maintain a sustainable development, in all its dimensions, it is critical to consider current recreational use, how it is likely to change in the future and the stimuli behind it.

The New Mountain Experience

The main purpose of this project is to analyse trends in recreational use of the Swedish mountain region at different spatial levels to support and critically examine a sustainable development in the light of the environmental objective. The Swedish mountain region has a long history of recreational use, but more recently new activities and changing recreation behaviours have been observed. The project will therefore take advantage of previous studies of mountain recreation in Sweden to analyse current use and trends with special focus on activities, experiences, benefits and impacts. Besides analysing trends in more traditional use, the project will emphasize contemporary recreational phenomena that are of utmost importance for future development: outdoor events, sportification and indoorization of traditional outdoor recreation activities, the use of new technology and social media. The aims of the project are;

- To analyse trends in recreational use of the Swedish mountain region with respect to (i) recreation activities, experiences, motives, benefits and impacts; (ii) eventification, sportification and indoorization; and (iii) use of new technology and social media.
- To analyse how trends in recreational use will impact a sustainable development of the mountain region and to critically examine the environmental objective with respect to recreational experiences.
- To provide input for a more efficient planning, management and development of the mountain region with respect to the environmental objective.
- To evaluate use of new technology in data collection and visitor monitoring, including the efficiency of different monitoring approaches to measure different user groups.

Mountain Recreation Trends

Given the size and complexity of the Swedish mountain region, data requirements at three spatial levels have been conceptualized – local, national and international – based on information usage and following the most recent guidelines including harmonization with adjacent countries (Kajala *et al.*, 2007; Yuan & Fredman, 2008). At the national level, a web-based panel survey representative of the Swedish population has been used to collect data on domestic recreation in the mountain region (3 waves of 1000 responses each during 2013). The web-survey was supplemented with a traditional postal survey sent to a sample of 1000 individuals. These surveys will replicate selected parts of previous studies on mountain recreation (i.e. Fredman & Heberlein, 2003) providing trend data from 1980 up to present time. Initial results from the current data show that;

- Almost half the Swedish adult population (15-70 years old) has visited the mountain region at least once during a five-year period. Visitation is most popular in the winter months (January to April) – 15 % of the population did at least one visit to the mountain region during this period in 2013.

- The average annual number of visits to the mountain region was 1.9, which implies a total number of visits of almost 4 million during 2013. The average length of stay was 5.7 days.
- Downhill skiing is the most popular activity during January to April (participation 67% among visitors) followed by cross-country skiing (participation 35% among visitors). In the summer period (Maj-August) walks in nature are most popular (participation 78% among visitors).
- When asked what recreation activities people think will increase the most in the mountains the next 10 years mountain biking, downhill skiing, hiking and backpacking are most frequently mentioned.
- The average expenditure for a visit to the mountain region is SEK 9 252 (1 EUR ≈ 8 SEK). Winter visitors spend about 10% more compared with summer visitors.

Future analyses will focus on trends in these data with respect to e.g. spatial visitation patterns, activity participation and demand for lodging. Through a mixed method approach, quantitative information will then provide input to a qualitative analysis of impacts on sustainable development in general with special emphasis on key parameters of the environmental objective "A Magnificent Mountain Landscape".

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Generation Y and outdoor recreation. Changing meanings of nature in Finland

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The value of natural environments and green spaces in urban environments on promoting human well-being has been widely recognized (Chiesura, 2004). People's personal experiences and affective relationship to nature are also integral predictors of environmentally responsible behaviour (Ojala, 2012). Hence, it is increasingly important to take human values of nature into account in urban planning.

The urbanization and digitalization process taking place in Finland and other western countries has led to changes in the ways people spend their free time. Leisure behaviour of today's youth, so called Generation Y, is different from that of the previous generations (Puhakka, Poikolainen and Karisto, 2014). This development has also had impacts on outdoor recreation and the human relationship with nature. Recently nature-based tourism has grown fast and patterns of outdoor recreation have become more diverse (Bell *et al*, 2007). Natural environments are increasingly valued for their beauty and aesthetic experiences they afford. While the public use of nature is changing from subsistence to recreation, the role of direct contact with nature has appeared to decrease in society. Children's and adolescents' independent mobility and the possibilities to connect with nature in everyday life have diminished (Skår and Krogh, 2009).

Study methods

This study explores Generation Y's outdoor recreation and relationship with nature in Finland. The research questions are: 1) how do today's young people recreate outdoors, 2) what values and meanings do they attach to outdoor recreation and nature, and 3) how their relationship with nature is developed. The study aims to distinguish potential future changes in outdoor recreation and the human relationship with nature. The study was conducted in the town of Lahti and the surrounding area in 2013 (Puhakka, 2014).

The method of thematic writing was used in the study. Young people were asked to respond to open-ended questions related to five themes: (1) leisure time and favourite places, (2) definitions of nature, (3) leisure time outdoors and the importance of nature, (4) most preferred natural environments, and (5) the knowledge and skills learned from the previous generations. Moreover, young people responded to a structured question about their participation in various outdoor activities. The data were collected from the pupils of two schools (N=184). The respondents were born between 1992 and 1998, and over two thirds (69%) of them were female.

Results

Among the young respondents, the most popular outdoor activities in summer time were sunbathing and spending time on the beach or in nature, and swimming in natural waters (Figure 1). During wintertime, the participation rates were lower than in summer time, but around a fifth of the respondents participated in nature photography and cross-country skiing every month. Thematic writings gave further information about the respondents' outdoor recreation. The most common activity, mentioned by almost two thirds (63%), was walking, jogging and spending time in nature. Young people also mentioned some new forms of outdoor recreation, such as airsoft. However, nature may be important although it is not 'used' for special activities.

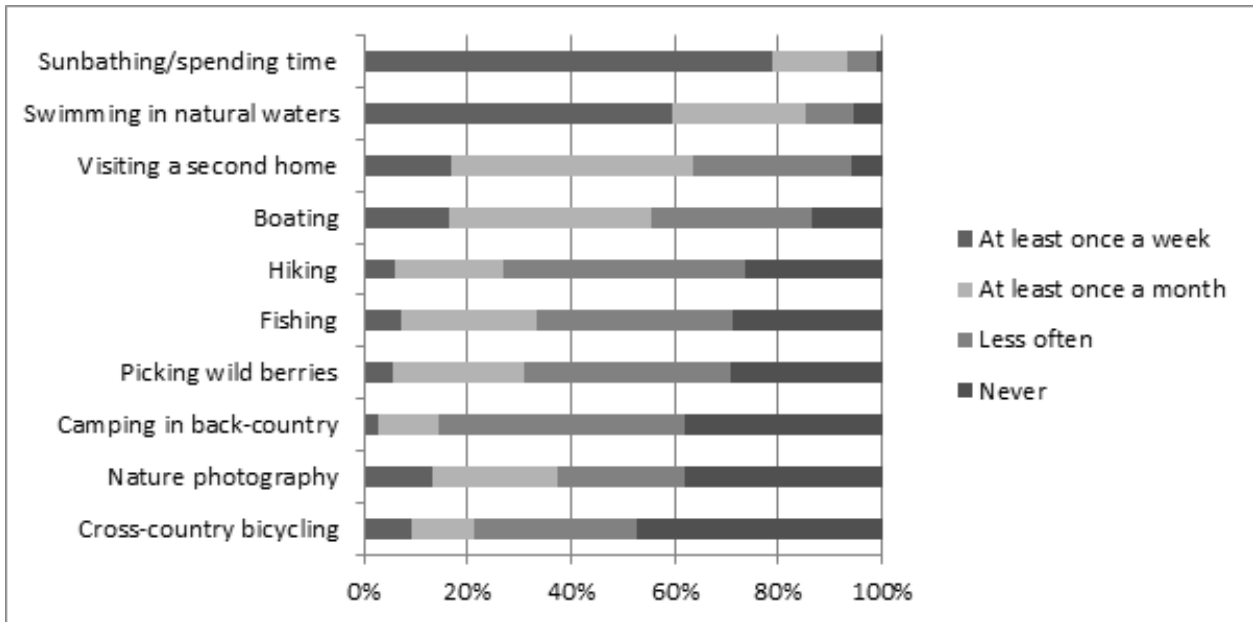

Figure 1. Most participated outdoor activities in summer time among the young respondents (%, N=184).

Almost half (44%) of the young respondents recreated outdoors actively and considered nature important, while nature was somewhat important for 45 percent and not at all important for 11 percent of the respondents. Nature turned out to be more important for women than men. Some young people (12%) had a favourite place located in natural environment, for instance at the shore of the lake or on the hill in the forest. Second home was mentioned by eight respondents (4%). Although the young respondents usually spent leisure time with their friends, nature was also a place of being alone.

The most important motives for outdoor recreation were relaxation, good feeling and escape from everyday life (31 %), peacefulness and silence (18 %), freshness and cleanliness (6 %) and the beauty of nature (6 %). The most common reason for not spending as much time in nature as the respondent would like to was the lack of time (6 %). Negative aspects of nature were also reasons for not spending time in nature, for instance insects (10 %), weather conditions (4 %), lack of activities, unsafety etc.

The study results emphasize the importance of the previous generations in transferring the close relationship to nature. Most of the respondents who considered nature important (84%) or somewhat important (71%) had learned nature-related skills and knowledge from their parents or grandparents. Of those who did not consider nature important, less than half (47%) had learned these skills and knowledge from the previous generations.

Discussion

Nature is primarily a recreational environment and a source of experiences for Generation Y. This generation is from the background more urbanized than older generations, which reflects in their perception of nature and outdoor recreation. There are signs of polarisation: some young people have inherited the valuation of nature and emphasize its importance, while some others do not have any connection to it. The study results stress the role of summer cottages as 'gates to nature' in the urbanized society.

Outdoor recreation seems to be dependent on the age and life phase of individuals. Therefore, it is challenging to predict the future. Today's young people may increase outdoor recreation in later phases of their life span; they have nature-related skills and interest towards nature, but other issues are currently more important in their lives (e.g. friends, other hobbies, school). Longitudinal research is needed to identify the generational differences.

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Monitoring attitudes to nature-based tourism: A case Study of Japan's National Parks.

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Introduction

Japan's original National Parks Act (1931) was expanded in 1957 to the Nature Parks Law, with jurisdiction over national, quasi-national and prefectural nature parks. This hierarchical three-tiered system has survived subsequent amendments, and national parks still represent the strictest level of conservation while functioning as a platform for tourism and regional development. The number of annual visits to them rose rapidly in the 1950s and 60s when rapid economic growth and urbanization brought construction of new bullet-trains, highways and other access infrastructure along with widespread car ownership. Although numbers stagnated in the 1970s, the 80s saw further growth. Visitation peaked at 415 million in 1991, before declining to 309 million in 2011.

Research design

Research objective and key terms

The recent decline in visitation has direct implications for national park management and reflects indirectly on society's changing relationship with nature. Yet academic research remains focused on congestion at certain honeypots without addressing the downturn. This study aims to explore broader attitudes to nature-based tourism, characterized by its location in natural destinations, in order to unpackage the downturn in visitation to Japan's national parks. Empirical evidence is used to identify potential cause factors for the decline in visitation via a two-pronged approach consisting of i) overall affinity for nature and awareness of national parks; and ii) willingness to visit parks.

Selection of data

The data set in Fig.1 consists of Ministry of Environment (MOE-J) records of national park visit numbers from 1950-2011. Although this data relies on an eclectic mix based on accommodation and visitor centre indicators, the estimate still provides a benchmark of macro trends. Furthermore, these findings can be supplemented with evidence from opinion polls that monitor attitudes to national parks and nature-based tourism. The second data set thus draws upon the results of one such survey that was conducted at national level by the Cabinet Office in August 2013 (COGOJ, 2013). A total of 3000 survey packs were distributed and 1,842 questionnaires were returned, a rate of 61% , which easily exceeded the minimum requirement of 350 forms needed at error of ±5%.

Findings

Affinity for nature and awareness of national parks

83% of all respondents claimed to feel interested in nature, including 40% who were "interested" and 44% "somewhat interested." Less than 5% were "disinterested" in nature, although this proportion with age up to a maximum 7% among respondents aged 70 and over. Among the youngest group aged below 30, only 24% were sure about their interest in nature, whereas a combined 19% were "somewhat disinterested" or "disinterested" in it. Among different models of protected areas, respondents' level of awareness of national parks (90%) outranked others such as UNESCO world heritage sites (85%), quasi-national (64%) and prefectural nature parks (48%).

Willingness to visit national parks

Despite high levels of awareness and stated affinity for nature, only 47% of respondents chose to visit a national park among other protected areas, compared to 70% who wanted to visit a world heritage site (multiple answers were allowed). When asked directly, a combined 85% did want to visit a national park, but in younger age groups, the reported "disinterest" in nature translated into less willingness to visit national parks, with fewer than half (47%) eager to visit compared to a median of 62%. The youngsters' lack of desire to visit national parks was even lower than the 70+ group (56%) at the other end of the age scale, where physical barriers are a significant impediment.

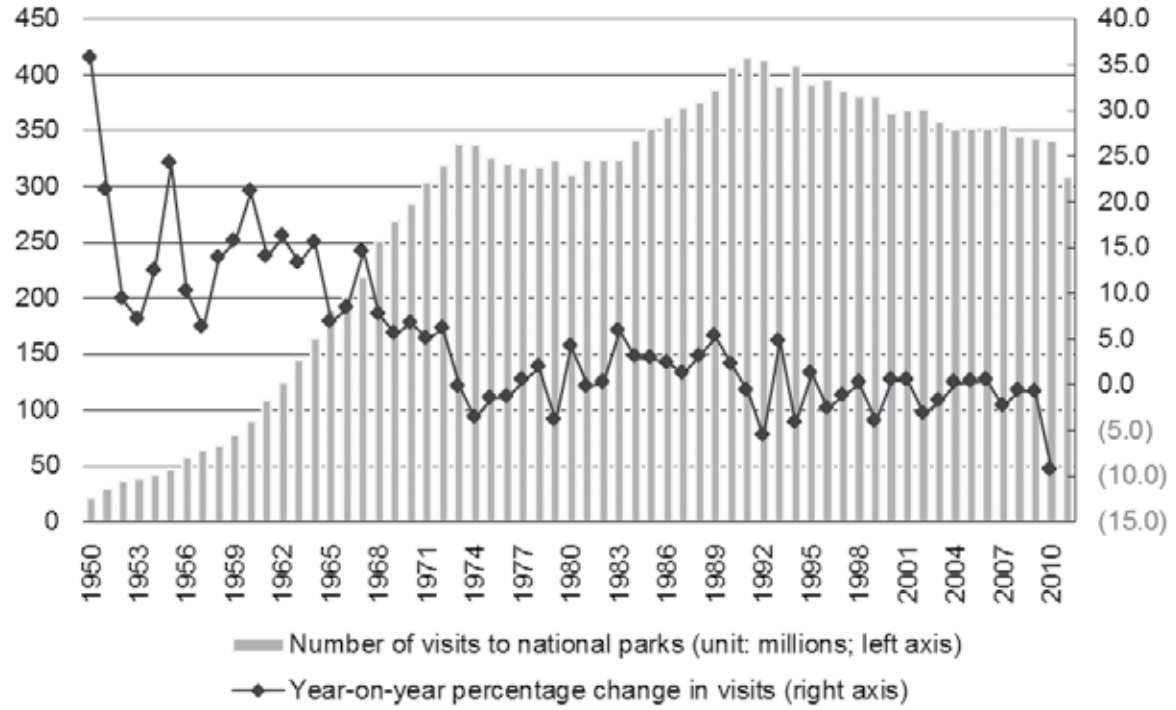

Figure 1. Annual visits to Japan's nature parks 1950-2011 (Source: MOE-J, 2013)

Discussion

This research combines MOE-J national park visit data from 1950-2011 with a COGOJ opinion poll monitoring attitudes to national parks and nature-based tourism. Results show the number of annual visits had declined by over 25% in 2011 compared to the peak in 1991. Thus demand for nature-based tourism seems to be shrinking, and despite high levels of awareness and stated affinity for nature, visiting national parks is a less popular choice than other protected areas such as world heritage sites. The desire to visit national parks was especially low among younger age groups, with fewer in this demographic interested in nature. More research is needed to contextualize this finding and identify potential counterstrategies to attract younger visitors. Also, other possible factors should be acknowledged including changes in the demand structure with diversification away from large-scale bus tours in favour of smaller groups or individual travel, with an increase in special interest tours (SITs), ecotourism and green (agro) tourism (Katō, 2008).

These findings should be treated with caution due to limitations in coverage, with younger people potentially underrepresented in the opinion poll – this could be rectified in future studies by offering an on-line version. Although this kind of macro study necessarily entails a degree of generalization and stated preferences can be unreliable, monitoring national trends in visitor demand and attitudes to nature-based tourism is a crucial step for park management. The case study of Japan's national parks has both practical and methodological implications for protected area planning and marketing.

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Mainstreaming ecosystem services into decisions – a choice experiment on the future use of Parque Nacional Cumbres de Monterrey/Mexico

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Introduction

The city of Monterrey is located in the north-eastern part of Mexico. Monterrey is one of Mexico's most developed cities, with the highest per capita income in the nation. It is regarded as a highly developed city and is very likely to continue growing in the future, despite its extremely mountainous surroundings. Most important and most famous is the Sierra Madre Oriental south of the city where the "Parque Nacional Cumbres de Monterrey" (National Park) is located.

Monterrey has a semi-arid climate and is one of the warmest major cities in Mexico. Water resources are therefore crucial and likely to limit the growth of the city in the future. One of the most important catchment areas for potable water is the Cumbres National Park. Many water sources of the park are already used to supply water to Monterrey. The Cumbres National Park is also the home of many endemic species and the local hot spot for outdoor recreation activities close to the intensively populated metropolitan region.

For the future development of Monterrey water supply is the crucial factor, but a more intensive extraction of the water resources in the national park might influence its biodiversity. A strict focus on water resources by city planning and regional management might also impact the recreational use in the park as well as housing development and tourism infrastructure in the park.

The supply of fresh water in Monterrey currently relies strongly on the reuse of water, which is mixed with fresh water sources. Protecting the remaining water resources in Cumbres National Park could therefore lead to two effects: increasing water bills for city residents to tap new sources far from the city, and/or increasing the reliance of treated sewage water.

The example of Cumbres National Park and the city of Monterrey represents a typical dilemma which many city planners, decision makers and regional managers face. The planning process needs to answer crucial questions such as:

- how to account for the ecosystem services accruing from the park, and
- how to integrate public values and preferences into planning and decision making processes.

In a city like Monterrey with a very versatile social structure it is also relevant to know which segment of the local residents will be affected by management actions such as an increasing water bill or restrictions for housing development in or close to the park.

Methodological approach

Literature on ecosystem services shows an increasing interest in understanding how to bundle eco-system services and how to integrate trade-offs between different services explicitly (Kareiva *et al.*2011). A literature review revealed that valuation techniques are helpful tools to combine both the monetary value, e.g. the water-bill, and other social values (Daily 2011, Heal 2000, Dasgupta 2001, Birol *et al.* 2010).

In our case study we use a questionnaire to learn how the local population perceived the required trade-offs and to see whether different segments in the local population might be affected differently by the various options. The survey contained a stated choice survey attributes describing possible future states in terms of biodiversity, housing development, recreational opportunities, water management options and economic parameters. Choice models assume that individuals behave in ways that maximize their utility and their relative satisfaction for a particular alternative (Louviere *et al.*, 2000). The choice experiment provides a suitable basis to model intended behaviour, which can be combined with additional information in the form of co-variates, (i.e., expressing respondent mind-sets and characteristics) in a latent-class analysis. A decision support system (DSS) based on the choice model explains how the various attributes influence each other in decision-making. Figure 1 shows the choice experiment used in the questionnaire. The survey was conducted at many public locations in the city using several I-pads. Overall, 463 respondents from all parts of the city participated in the survey.

Fig. 1 Example of the choice experiment (translated from Spanish)

Preliminary Results

First of all the study underlines the high relevance of the park for the citizens of Monterrey. Two aspects turned out significantly:

1) The citizens of Monterrey value the park and its biodiversity, and
2) The extraction of additional water from the park is perceived negatively.

Further segmentation shows that two socio-demographic characteristics influence the decision making process significantly: where respondents live (living conditions as well as the distance to the park), and income. Citizens living far from the park and having a lower level of income would like to see the park strictly protected (about two thirds of the respondents). This includes restrictions for further housing development, tourism cabins as well as restrictions for outdoor recreation activities. However, although this group values the park highly, this group's capability to contribute to its protection via a higher water bill is low.

Citizens living close to the park are using it much more frequently for outdoor recreation purposes. This segment is in favour of tourism and recreation development in the park, but against further housing development. It seems that their rather high willingness to pay for the water is linked to its usability for outdoor recreation and tourism.

Overall the study shows that conservation strategies are highly appreciated by all citizens and that restrictions in housing development are also well accepted. The option to increase the water bill is rather limited for the majority of respondents and seems to be associated more with the immediate use of the park.

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US Forest Service Wilderness visitation after 50 years

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The National Wilderness Preservation System (NWPS) in the United States was created by the Wilderness Act of 1964 (PL 88-577). That act was signed into Law by President Johnson in September, 1964. The US Forest Service is one of four federal agencies to manage lands and waters that are part of the NWPS. Today, across all four agencies, there are 757 distinct land areas totalling over 44 million hectares in the NWPS. For the Forest Service the initial set of Wilderness areas covered about 3.6 million hectare in over 50 Wilderness areas. Since 1964, over 10 million hectares in more than 400 additional Wilderness areas have been added to the agency's holdings.

Recreational activity in the US has grown and changed dramatically since 1964. Between 1982 and 2009, participants in the activities that often take place in Wilderness settings increased substantially. For example, the number of day hiking and backpacking enthusiasts more than doubled, while primitive camping participants nearly doubled. Horseback riding increased by almost just under forty percent (Cordell, 2012). Wilderness areas managed by the Forest Service are estimated to receive a little more than 8 million visits annually.

In this paper, we examine characteristics of visitation to Wilderness managed by the US Forest Service. We present an overview of the characteristics of current wilderness visits. Some of the key aspects of visitation we examine are trip purpose, demographics, visit duration, travel patterns, and satisfaction. We also compare visit characteristics across several time or space dimensions for Wilderness areas. The first is comparing visitation data obtained from forests surveyed through the National Visitor Use Monitoring (NVUM) program in 2005-2008 with data from the same forests in 2010-2013. Such a comparison may give an indication of how Wilderness visitation is changing, and what sorts of visitation patterns managers can expect to see in the future.

We anticipate that there may be qualitative differences among Wilderness areas according to when they were designated, the size of the Wilderness area, or its location relative to population centres. That is, the Wildernesses designated in the first few years of the system could be of a different character than those designated later on. If so, there could also be differences in the types of users or visit patterns for these areas. Larger areas may provide greater opportunities for longer visits or more solitude than smaller areas, which may appeal to different demographic groups. Wilderness areas that are closer to population centres may be more attractive destinations for people with limited recreation time than those that are more distant, and thus may have shorter average visit durations.

Data for visit characteristics comes from the NVUM program. Wilderness sites are one of the primary sampling strata for that program. Part of the data in the sampling framework geolocates the interview site, and identifies the Wilderness with which the interview site is associated. In turn, we are able to append information about Wilderness area size and year of designation, or compute proximity to population centres.

Recent data shows a noticeable increase in Wilderness visitation. For 2005-2009, the FS estimated 6.5 million visits to FS Wilderness. For the 2009-2013 period, the estimate rose to 8.1 million visits. Changes in visitation volume were not equal for all forests. Five forests showed increases of over 150,000 visits. All are located near major metropolitan areas that had sizeable population growth from 2000 to 2010, and have the majority of Wilderness visits coming from the area within about 50 miles of the forest. Two forests had declines of over 100,000 visits. Both are located at some distance from metropolitan areas, and have very few Wilderness users from the local area.

Over the last few years, most forests showed a greater proportion of visits coming from people living nearby, a greater proportion in shorter visit duration categories, and a decline in the proportion who visit Forest Service Wilderness as a side trip (Table 1). As well, there has been an increase in Wilderness visits as the single destination for a day trip from home. Our preliminary results indicate that these sorts of changes are not consistent across all of the categories of Wilderness that we examined.

Longer-term changes corroborate the finding the character of Wilderness visits has changed dramatically. In the 1960's 74% of Wilderness visits were multiple-day visits; Cole (1996) reported only about 25% were multiple-day visits. We estimate that now a little less than ten percent of Wilderness visits last more than 36 hours.

The paper highlights the differences across categories of Wilderness and the types of changes seen in recent years in each type. As well, we discuss some possible causes for the observed changes as well as some of the implications for managers.

Table 1. Comparing Wilderness visits over time.

Item	… percent of visits ….. 2005-2008	2010-2013
Travel Distance		
0-25 Miles	24	27
25-50 miles	15	19
50-100 miles	14	14
100-200miles	11	11
200- 500 miles	13	11
Over 500 miles	22	18
Visit Duration		
< 3 hours	41	43
3 – 6 hours	29	32
6 – 12 hours	11	10
12- 36 hours	6	7
36-72 hours	6	4
Over 72 hours	6	4
Wilderness visit is side trip during a trip to some other destination	18	14
Wilderness visit occurred on a day trip away from home	46	52
Wilderness was the only place visited on the forest	57	61

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Understanding future demand for outdoor recreation

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Introduction

Is it possible to understand future demand for outdoor recreation? This knowledge would be extremely useful as recreation managers not only have to respond to current participation and issues, but also have to plan and develop the infrastructure and opportunities for the future. Understanding future demand would ensure that future provision is better able to meet people's needs.

Methodology

This research utilised an extensive dataset on participation in outdoor recreation from a longitudinal national survey which was undertaken over two 12 month periods – 2008-2009 and 2011-2012 (Welsh Outdoor Recreation Survey 2008 and 2011). Each 12 month survey resulted in a sample of over 6000 respondents, and provided a comprehensive evidence base on outdoor recreation covering the following topics:

- overall participation in outdoor recreation
- types of activities and places visited
- barriers and motivations
- stated preferences for future demand

Results

In order to understand potential future demand for outdoor recreation in Wales, this research analysed the results of these surveys based on two approaches:

a) 'backward' look using trend data which identified changes in recreation behaviour over a period of 3 years
b) 'predictive' look using stated preferences which asked people to say what they would like to do in the future

An overall assessment of future demand was gained by comparing the results of both the above approaches and identifying commonalities. This work was supplemented by considering the results in light of wider demographic trends in the general population.

Changes in Recreation Behaviour

Firstly, the research considered what past changes there had been to participation, with the assumption that if those changes continued in the same direction that they would be indicative of future recreation. Key changes were found in the evolving pattern of recreation behaviour:

- People had become more 'multi-activity', undertaking more than one activity rather than just a single approach. Consequently, there had been an increase in participation in wider range of activities.
- In particular there had been an increase in wildlife watching, visiting outdoor playgrounds, and cycling.
- Related to the increase in cycling, the analysis also found that there had been an increase in the overall level of physical activity amongst the population, resulting in improved health benefits.
- The places that people visited had changed with an increase in visits to woodlands and beaches.
- People had also changed to visit places, which were closer to home, and for their outdoor recreation trips to be of a shorter duration.

Stated Preferences for Future Recreation

The surveys in 2008 and 2011 asked people whether they would like to take part in outdoor recreation more in the future, and if they did, what activities they would like to do more of and which places would they prefer to visit more frequently. In order to help understand why those preferences might not be realised, the surveys also asked what barriers people faced in relation to future participation. The key findings of the analysis showed:

- Over half (60%) of the adult population in Wales would like to take part in outdoor recreation more often
- In particular, demand was higher than average amongst those who were currently infrequent participants, unemployed people, those in the oldest age groups (over 75's)
- In both 2008 and 2011, the greatest demand was to take part in more walking, mountain biking, sightseeing, and road cycling.
- However, between 2008 and 2011, the relative demand for more walking and sightseeing declined.

- People expressed demand for a number of 'aspirational' places more often, in particular beaches, mountains, woodlands, and the coast.
- As with current participation, the main stated barrier to future demand was related to 'lack of time' and 'bad weather', along with health and disability concerns.

Overall Assessment of Future Demand for Outdoor Recreation

In considering the analysis of past changes to patterns of outdoor recreation behaviour together with a review of the results of people's stated preferences, there are a number of commonalities, which provide a strong indication of the future direction of participation.

It is clear that respondents are becoming more 'multi-activity', and expressed demand indicates that people will continue to participate in a wider range of activities in the future. Growth in demand seems to be focused on three main types of recreation: the active pursuits of mountain biking and cycling, social experiences such as family-based activities, and the more passive pursuit of wildlife watching. More traditional activities are consequently static or declining.

There is an increase in demand for more 'convenient' recreation opportunities, with people preferring to visit places, which are close to home with trips having an overall shorter duration. Future provision of outdoor recreation should therefore consider developing opportunities that provide for participation in more 'bite-sized' chunks.

The research found that there appeared to be a contrast between the types of places people currently visited, which tended to be more accessible local parks and woods, with the types of places they stated they would like to visits more in the future, focusing on beaches and mountains. Consideration needs to be given to balancing these two different preferences in the future, providing for both convenient doorstep opportunities and aspiration trips to more iconic landscapes.

Finally, the research has indicated that although overall levels of participation have remained static, the socio-demographic profile has changed slightly. Changes between 2008 and 2011 have show that there has been a slight increase in the participation levels of older people, those with a disability, and unemployed people. It is likely that this is associated with interventions from the public and voluntary sector, which have specifically targeted increasing the participation amongst these groups. With wider demographic trends indicating an aging population, it is probable that we will continue to see a growth in the participation in outdoor recreation by these socio-demographic groups.

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SESSION 5C VALUES AND PREFERENCES

Assessing indicators of attractiveness in the Krkonoše Mountains National Park Trails, Czech Republic

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Petr Sklenička, Czech University of Life Sciences Prague, Czech Republic

Introduction

Balancing between the protection of natural and cultural values while trying to provide high levels of satisfaction among visitors is the main challenge and goal of protected areas management agencies. With the continued growth of national designated protected areas in the world and increasing popularity and participation in nature-based activities, potential conflicts may appear threatening the principles according to which these areas were classified. This is particularly so in protected areas' trails since they represent the main recreation facility on which recreation activities are performed.

Nowadays, there is an on-going need to manage visitor uses and its effects, as such, objective data is essential to inform and support trail managers, so they can evaluate the level of need for visitor management and control the related impacts before they become unacceptable. Although, studies documenting social science issues continue an uncommon trend, when comparing with the numerous well-established research programs to assess the ecological health of trails. This represents an eminent concern for these protected area facilities with high ecological, cultural and managerial value and great visitor demand, since its vulnerability requires for their planning and management the understanding of the multiple and complex aspects related with visitor participation in recreational activities.

In the Czech Republic, a country with a wide network of protected areas with natural characteristics of outstanding value and a long tradition on the practice of outdoor recreation in natural areas this presents an important concern. Studies on the outdoor activities in the Czech Republic protected areas' trails have mostly focused on the negative effects of tourism and visitation rates. However, there is a lack of studies exploring visitor attitudes, motivations and preferences and their relation with the character of the trails visited. In this light, this paper presents a research method for assessing the main aspects behind certain recreational choices, more specifically why visitors prefer particular type of trails in the Krkonoše Mountains National Park (KRNAP).

Methodological Approach

The KRNAP is a protected area located in the north-eastern part of the Czech Republic, occupying an area of about 54,969 ha. Historically it's the crown jewel of the national protected areas, being the first national park of the country. It is dominated by one of the most original and interesting types of landscape, where vigorous and stunning natural features are combined with diverse forms of humanization. Because of its singular landscape and privileged location, the park is one of the most visited protected areas in the Czech Republic, and for this reason, park visitors have been monitored by on-site counters since 2011.

The proposed methodology was divided in three different complementary phases (Table 1). First, a direct data collection method was used to monitor visitor numbers in protected area trails. With this effect, 27 on-site counters have been placed in the most valuable parts of KRNAP, registering the number of visitors who crossed main sectors of the vast hiking trail system. In this way, it is possible to understand which are the most visited trails within the study area and group them according to their popularity.

Subsequently, field analyses of pre-selected characteristics along the trails are conducted during field trips in order to validate features that are not presented in cartographic information (e.g. number of vistas, character of views, number of attractive places, etc.). The collected data is then inserted into a database and analysed using appropriate statistical software. Thus, it is possible to recognize and relate the influence of particular trail and surrounding landscape characteristics with the popularity of different KRNAP trails. These features of the trails and sorrowing landscape are named as indicators of attractiveness and are considered the physical and ecological aspects behind visitors choices.

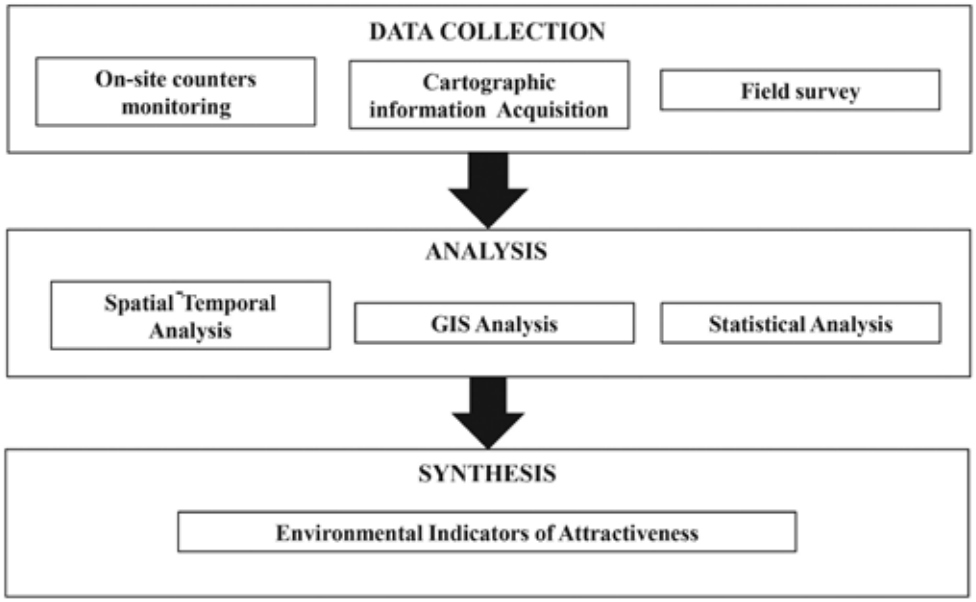

Figure 1 - Methodology diagram

Conclusions

The monitoring of visitors' aspects is nowadays an essential part of the integrated management of protected areas trails. The present study and its methodology allows a better understanding of public use dynamics and preferences at KRNAP trails, serving as a basis to implement a high-quality management of these important park facilities. Visitor numbers and its preferences are essential since they represent basilar information required to address a variety of issues, including the capacity of the existing trail system to accommodate the current demand. Thus, further planning and management of protected areas must involve the adoption of long-term monitoring programs on visitors' aspects, so that the values due to which they were classified do not succumb under the current tourist demand.

How I see myself and how I see others: How do the values of visitors to an urban park Influence their behaviour?

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Usually visitor surveys carried out in natural or semi-natural areas consist of questionnaires that explore visitor behaviour in order to define different park-user profiles. The information obtained is used by the park administration to justify the implementation of specific programs regarding environmental education, improvements to infrastructure or the establishment of certain environmental management programs. Our study took place at the Parque Zoobotânico Museu Paraense Emílio Goeldi (PZB), a botanical park and zoo in the northern Brazilian city of Belém that contains various enclosures with captive wildlife. In this study we compared questionnaire responses given by visitors to the PZB against their actual behaviour. The behavioural data was collected via a pre-organised set of direct observations made within the park. We found that when questioned about their personal behaviour visitors typically responded with the most socially acceptable answers. However when questioned about the behaviour of other visitors the responses were more critical, pointing out problematic behaviour that interfered with the quality of the experience for everyone else. This discrete evaluation of visitor behaviour was made by anonymous observers at pre-determined locations, and complemented the data collected through the questionnaire. We contend that in combining these two datasets one can gain more reliable information regarding the true values of park visitors, and that this combined data would be of great use in park management programs.

Methods

Summary of a typical visit and local user.

The data was obtained through the use of structured questionnaires including yes-or-no questions, multiple choice and more open questions that allowed personalised answers. Data was collected on 14 different pre-selected dates, encompassing both weekdays and weekends. We were able to work with a reliable sample set of 345 questionnaires representing around 2% of total park visitors for the evaluated period. Only visitors appearing to be older than 12 years were approached for an interview.

Visitor behaviour over time and in different locations.

The choice determining activities and the live experience in a natural area is influenced by the social group that an individual belongs to (Christensen & Davis, 1985). Urban planners can therefore perceive the quality of recreational experiences in a different way to users (Sowman, 1987). The preferences of the two groups studied by Magro *et al.* (1997) confirmed this tendency, the authors concluding that public perceptions are different to those of professionals that plan or manage protected areas. Collecting information via questionnaires without taking into consideration direct observations of user behaviour could therefore fail to adequately inform the management of public use of natural areas.
Observation of visitor behaviour was performed through direct observation of individuals and groups, these subjects being chosen in a systematic way at the principal entrance to the park. Information on visitor behaviour was compiled at specific sites. General survey data, obtained via questionnaires, were used in this study, but the direct observation of visitors permitted us to perform a more complete analysis of the way individuals organised their time in the PZB and to test for a correlation between the visitor questionnaire data and their subsequent behaviour. 88 observation records were taken at in the vicinity of the animal enclosures and 51 were taken at various other sites in the park.

Results

The results discussed within this study refer principally to the identification of values that demonstrate whether or not the respondents would be receptive to programs related to the environment, and to the suitability of conducting these within the PZB in front of captive animals. One of the problems facing analyses of survey data is to know whether the actions of the respondee correspond with what they have said. This problem arises from the fact that faced with the quantity of information in the public sphere concerning the natural environment and climate change, most people feel an almost moral obligation to state that they are concerned about the quality of the environment.

45.5% of interviewees declared that they think about environmental problems everyday, around 43% think about them occasionally and 10% were brave enough to admit that they did not think about these issues on a daily basis.

To offer food or not to the captive animals would reflect a basic awareness of PZB philosophy, and 89.85% of respondees were aware of these rules. Through the data taken from direct observations presented in Figure 1, we see that the majority

of interviewed visitors behaved properly in this regard. Nevertheless, 43% of respondees declared that they had seen others offering food to the animals in the enclosures. Probably, visitors are aware that this action is wrong, but still do so in order to gain the attention of the animal. This behaviour was seen during the direct observations. Amongst the interviewed visitors that saw others trying to feed the animals 57.15% took no action, 17.8% gave some kind of advice to the offender and only 2.28% called park staff. It is important to point out that the people observed were not the same people who filled in the questionnaire.

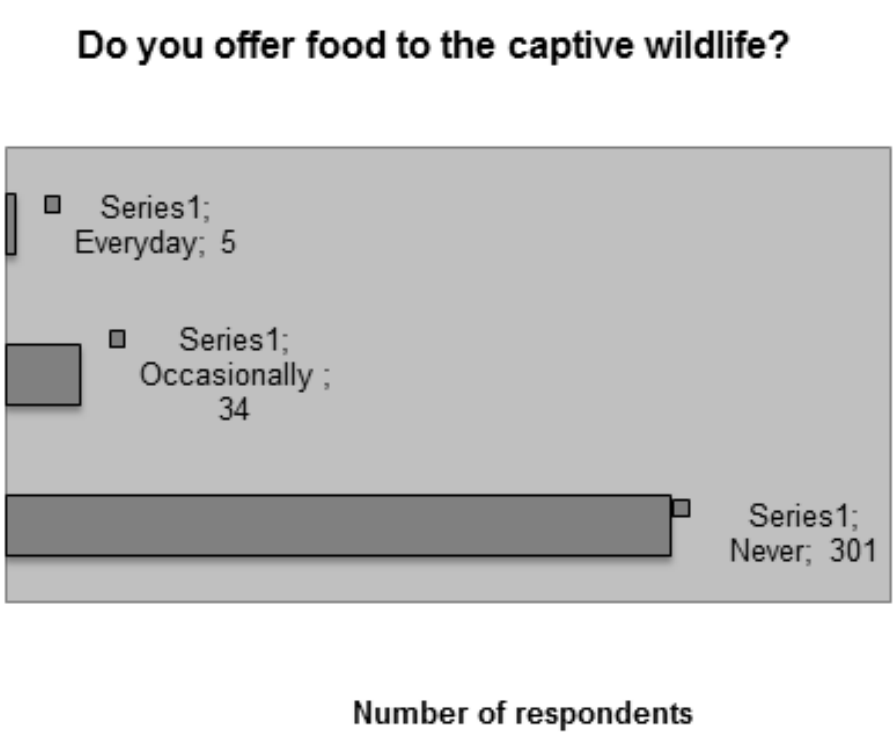

Figure 1: Most of the interviewees declared not offer food to the animals.

It was noticeable how adult visitors attempted to induce inappropriate animal behaviour around the enclosures of caiman, turtles, feline species and spider monkeys. The reaction of the animal was commonly provoked through sudden movements, the throwing of objects or shouting. Unfortunately images presented in the media (principally television) tend to exclusively show animals in the midst of an action or movement, generally induced by the film-makers. It is exactly this type of animal behaviour that visitors wish to see, and indeed which visitors describe as their principal motivation for visiting the urban park in the first place. Future management prescriptions for this particular park could be in part based upon the usage of several particular indicators that we have established through this dual method of data collection. These indicators correspond to particular user behavioural profiles. We present here as an example four of these indicators: 1) Individuals that occasionally offer food to animals (<2%); 2) Individuals that occasionally view another person offering food to animals (<10%); 3) Individuals with complaints regarding the inability to find bins for rubbish (<10%;) 4) Individuals with complaints regarding the inability to find somewhere to sit down.

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Results of forest-preference surveys in Switzerland

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Marcel Hunziker, Swiss Federal Research Institute, Switzerland

Introduction

In Switzerland, studies regarding visual preferences towards forest have been conducted since many years. Thereby, principally three types can be distinguished: (1) Studies considering forest-internal views focusing on preferences regarding forest characteristics such as structure, share of deadwood etc. (2) Studies about the perception and assessment of (spontaneous) reforestation of abandoned agricultural lands, where the focus primarily lied on the view from outside onto the (growing) forest and thus on the amount and distribution of forest. (3) If reforestation takes place the views from respective places to the surroundings become more and more reduced. This can have differing effects due to the visual quality of the surroundings.

In the following (and the corresponding presentation) a short overview of the well-known first two types of studies will be provided, whereas the focus will lie on the third type.

Preferences regarding forest characteristics (view from inside)

In Switzerland, several studies have been conducted regarding forest-characteristics preferences. The most recent one was part of the so-called "socio-cultural forest monitoring" (WaMos) (Hunziker *et al*. 2012). It investigated not only the expectations from the forest experience but also the respective assessment of the mostly visited forests. The study found that the people usually prefer the forests to be divers, legible, coherent and mysterious. They differentiated more concrete forest attributes such as the existence of dead wood, species distribution, infrastructure elements and so on. E.g., dead wood was highly preferred by many people and at the same time highly rejected by many others, resulting in a medium preference value with a high variance for this forest element. Mostly, however, the expectations and perceived actual state matches well which explains the high satisfaction with forest visits in Switzerland.

Preferences regarding reforestation (view from outside)

Spontaneous reforestation of abandoned agricultural land represents one of the main issues of landscape-preference studies since decades (Nohl 1976; Hunziker 1995). They all found similarly that – from the point of view of landscape preferences – spontaneous reforestation is welcome up to a certain degree, whereas complete reforestation, i.e., when agricultural land with open views turn to a closed forest, represent a landscape aesthetical loss. However, a more recent study (Hunziker *et al*. 2008) questions this bell-shaped preference curve, as the Swiss people, i.e., the majority who lives in the peri-urban lowlands – also appreciated even completely reforested areas – at least if perceived from outside.

Preferences regarding view-reduction caused by reforestation (inside-out view)

To investigate to what extent spontaneous reforestation affects the view on the surroundings a study in the Swiss Alps, where this view has a high value for tourism, was conducted. First of all, the possible reforestation in the Swiss Alps until 2021 was included into a view-shed analysis in order to quantify the reduction of the view from hiking paths between 2011 and 2021 due to reforestation (Schüpbach *et al*. 2012). To valuate the effect of the view reduction from hiking paths on landscape preference, participants in a survey were asked to rate manipulated photographs of different landscape scenarios by attractiveness (Junge und Hunziker 2013). Starting from an open view on a valley, on a traditional and on a modern village in a valley respectively, in each scenario the view is gradually reduced (33%, 66% and 99%) by forest re-growth. Moreover, participants were asked to state their opinion on different aspects of alpine farming.

The view-shed analysis revealed in most cases a reduction of 10-30% of the original view in 2011. It furthermore showed, that a reduction of the view of more than 30% is often caused by reforestation close to the hiking path.

The preference ratings of the landscape scenarios show that a reduction of the originally open view by 33% and by 66% due to reforestation is preferred to the original open view. A total reduction of the view is less preferred than the status quo, however, it is preferred to the open view on a settlement area independent of its quality (Fig. 1).

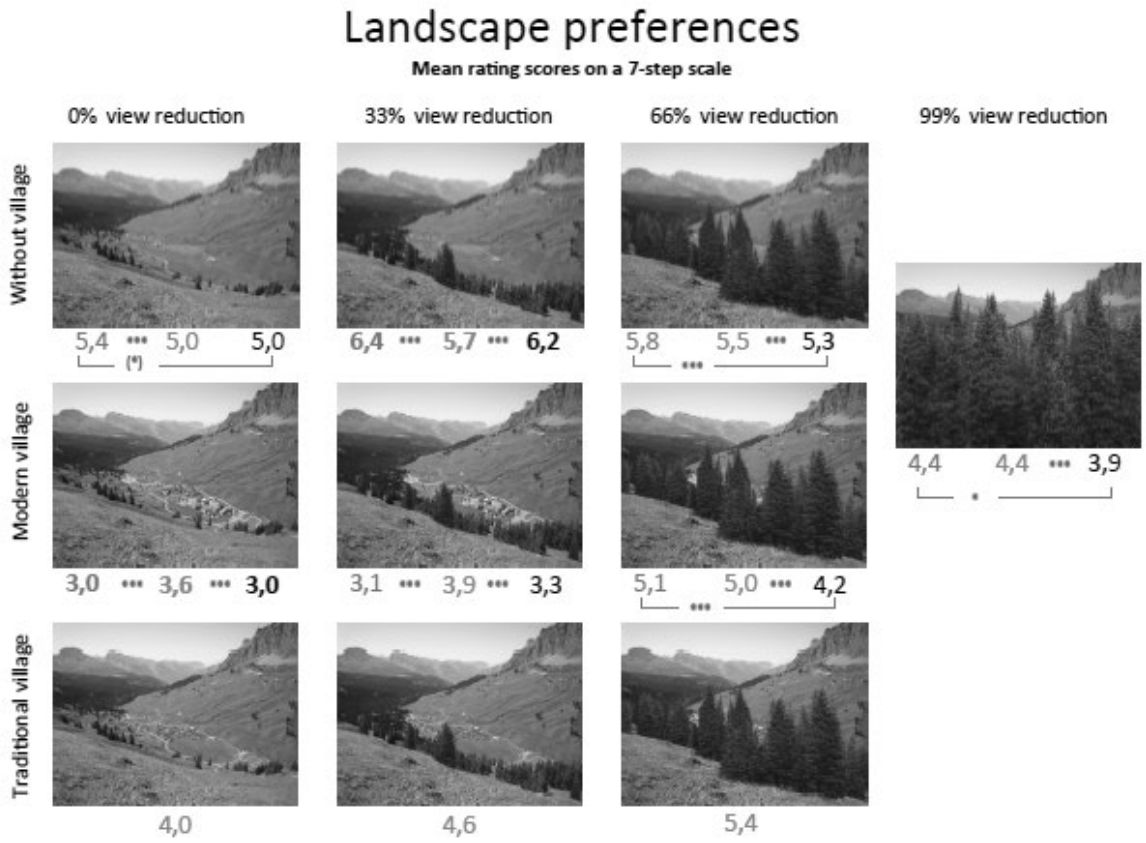

Figure 1: Landscape preferences for landscape scenarios of an alpine valley with a gradual reduction of the open view (33%, 66% and 99%) combined with the variation of a view on a "traditional village", a modern village" or "no village". Mean preferences scores on a 7-step rating scale from "totally dislike it" to "totally like it" from tourists (green), the Swiss public (red) and mountain residents (black) are shown. Group differences are shown in blue.((*) $p < 0,10$, * $p < 0,05$, ** $p < 0,01$, *** $p < 0,001$). Bold: Highest and lowest mean rating scores.

To conclude, the modelling and the survey results show that in most cases spontaneous reforestation will not seriously affect the assessments of the views from hiking paths in the Swiss Alps. The changes seem to be acceptable for the public and a partly reforestation is even valued positively by the Swiss public. Furthermore, we can assume that even a complete reduction of the view from hiking paths on settlement areas or roads are valued positively. Thus, measures against a total loss of view can be concentrated on those areas where open views on landscapes without signs of settlement areas or modern infrastructure would be hidden by reforestation.

Further research is needed to enable estimating the effect of view reduction if the fact is considered that the observers are usually moving on hiking trails. This might increase the acceptance of reforestation-induced view reductions at single spots, as it was investigated in this study.

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Investigating public preferences for forest recreation attributes: combined scenic beauty and discrete choice model

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Introduction

The main purpose of this study is to derive forest recreation demand in Jizerske Mountains Protected Landscape Area and to disentangle aesthetic factors that are responsible for changes in recreation utility of visitors. We estimate visitors' preferences for alternative forest sites as a function of site characteristics using choice experiment technique. As forest scenic beauty may represent a crucial factor in decisions of visitors in terms of which recreation area to visit, specific emphasis is put on the aesthetical perception of forest stands.

We analyse the individuals' aesthetical perceptions of the appearance of mountain forest stands in Jizerske Mountains using scenic beauty estimation (SBE) method. Aesthetic indicators of forest stands, represented by scenic beauty estimates, are used to measure the individuals' aesthetic values of various types of mountain forest, and they are further employed to improve the properties of welfare measurements derived by the choice experiment exercise.

Methods

This study combines several key methods: scenic beauty estimation introduced by Daniel and Boster (1976) and choice experiment technique based on Mcfadden´s random utility theory.

Scenic beauty estimation method enables to achieve continuous quantitative measures of aesthetic preferences for alternative forest management systems. SBE is based on the perceptual aesthetic judgments of observer panels and is designed to overcome several sources of bias of raw data on observers' evaluation of forest stands. SBE estimation has been applied to assess the impacts on scenic beauty of various timber harvest and silvicultural forest management procedures in many countries (Ribe, 2009; Fanariotu and Skuras, 2004). However, there have been only few attempts so far to use SBE estimates in further welfare analysis and only one of them was based on choice experiment model (Beardmore, 2005).

Choice experiment technique is designed to disentangle visitors' preferences on several visual and recreational forest stand characteristics, both of which enter the main model. Using random utility theory, we derive the demand for the forest stands, explaining the choice of specific forest stand with use of its environmental (visual and recreational) characteristics and the characteristics of the visitor that is making the choice among alternative forest stands.

The data for the research have been collected through a questionnaire survey, on-site in several locations in the central part of Jizerske Mountains. The survey focused on participants of summer recreational activities such as hiking and mountain biking, and resulted in a total of 722 completed questionnaires.

Results

Scenic beauty analysis reveals that visitors assign the lowest aesthetical values to dead and damaged forest stands compared to immature, high spruce and broad-leaved forests. The same results are obtained from choice experiment model: broad-leave and immature trees have positive effect on utility; the opposite effect has dead forest stands.

We find that higher scenic beauty is connected with more open forest stands with younger and smaller trees, which is consistent with the findings of previous studies (Brown and Daniel, 1984; Ribe, 1989). Broadleaf forests are the most aesthetically valued type of vegetation cover in Jizerske Mountains, mainly due to the fact that they consist of less dense vegetation with open treetop. Immature forests are also evaluated more positively than baseline spruce forests. Here, the whole effect is caused by the lack of high-grown trees in the view. As expected, the least aesthetically appealing type of vegetation is dead tree forest stands. With any evidence of disturbance in the quality of forests, the aesthetic value shrinks sharply, similarly to the results of Ribe (2009). Steeper terrain and occurrence of shrubs and herbage contributes to visual attractiveness of the forest stand.

The same types of forest stands that were evaluated under the scenic beauty estimation procedure were included in the choice experiment study. To estimate the regression parameters for each attribute's level under investigation, we use a conditional

(fixed-effects) logistic regression. We then precise the model with estimated scenic beauty standardized measures. The following table depicts the results of the full model including SBE measures.

Number of observation = 10 412			Log likelihood = -3 085			
LR chi2(15) = 1047.24			Pseudo R2 = 0.1451			
choice	**Coef.**	**Std. Err.**	**z**	**P>|z|**	**[95% Conf.**	**Interval]**
price	-0.004	0.00	-11.05	0.00	0.00	0.00
not crowded	0.60	0.08	7.89	0.00	0.45	0.74
very crowded	-1.04	0.07	-16.01	0.00	-1.17	-0.92
trail_panel	-0.26	0.11	-2.48	0.01	-0.47	-0.06
trail_stabilized	0.30	0.07	4.56	0.00	0.17	0.43
trail_forest	0.10	0.08	1.20	0.23	-0.06	0.27
trees_dead	-0.57	0.08	-7.36	0.00	-0.73	-0.42
trees_beech	0.23	0.07	3.34	0.00	0.10	0.37
trees_immature	0.24	0.06	4.27	0.00	0.13	0.36
sbe_beech_notcrowded	0.34	0.07	4.62	0.00	0.19	0.48
sbe_imm_notcrowded	0.47	0.07	6.77	0.00	0.33	0.61
sbe_imm_verycrowded	-0.38	0.09	-4.47	0.00	-0.55	-0.21
sbe_dead_notcrowded	0.38	0.05	7.59	0.00	0.28	0.47
sbe_dead_verycrowded	-0.36	0.10	-3.66	0.00	-0.55	-0.16
sbe_dead_stabilized	0.41	0.09	4.55	0.00	0.23	0.58

Table 1: Conditional logistic regression (full model)

The site characteristics that may increase a recreationist's utility associated with a visit to a forest stand are the low crowdedness of the recreation site (not crowded), sandy stabilized or natural forest trails (trail stabilized, trail forest), broad-leaved or immature forest stand type (trees beech, trees immature). The utility declines with high crowdedness of the area (very crowded), panel trails in the area (trail panel) and dead forest stand type of the forest (trees dead). The results also prove that all variables depicting the forest type have higher coefficients in the composite model than in the base model, which has noticeable effects on the magnitude of utility estimates.

Conclusion

There definitely is a clear link between forest management practices applied in protected landscape area Jizerske Mountains and the visual experience of visitors of the area. The utility of recreationists in Jizerske Mountains is greater when choosing a broadleaf or immature forest stand type, compared to coniferous forest. However, the sensitivity of the recreational utility is almost four times higher when a recreationist chooses a locality with a presence of dead trees.

These results may provide a support for the forestry management practices in the area, which nowadays concentrate on afforestation of the central part which had been extensively damaged by air pollution and insect infestation in 1970's, and also on the changes in tree composition (from spruce to broad-leaved trees more natural to the site).

Acknowledgment

The work on this paper was supported under the OMEGA programme of the Czech Technological Agency (project no. TD020049/ The use of pricing mechanism for tourism directing and financing the management of specially protected areas in the Czech Republic).

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Conservation through conversation – a brief review of geoconservation issues and initiatives from Vojvodina Province, North Serbia

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Nature consists of two equal parts, a living one – biodiversity, and its abiotic (non-living) equivalent – geodiversity (Gray 2008). Geodiversity is a shortened version of the phrase 'geological and geomorphological diversity' and has been defined as '*the natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (land form, processes) and soil features*' (Gray 2004, p.8). The endeavour of trying to conserve and enhance geodiversity (concrete examples of it which may be specifically identified as having conservation significance) is widely accepted as geoconservation (Burek & Prosser 2008). In most cases, nature conservation is associated with the protection of biodiversity as the most vulnerable element of natural environment. Unfortunately, there is a general thought (among geosciences community) of neglecting of geodiversity conservation in favour of biodiversity, as its conservation has a long tradition and as it is a fundamental part of the Earth's life support system. Although geoconservation (conservation of significant elements of geodiversity) has been practiced for over 100 years, it was usually the "Cinderella" of nature conservation regarding better appreciation of biotic natural segments as most people associate nature conservation with the protection of biodiversity (Gray 2004).

In order to change this broad opinion, the key geoconservation components should include understanding and valuing the geological sites through widely used methods that include interpretative activities to general public (Vasiljević *et al*. 2011). A new form of communication that can help people raise awareness on geodiversity values (aesthetic, scientific, functional, economic) and threats (vulnerability, human activities, natural processes) is defined as geotourism. Evidently, geotourism has much broader and complex meaning, as it is defined as "the provision of interpretative and service facilities to enable tourists to acquire knowledge and understanding of the geology and geomorphology of a site (including its contribution to the development of the Earth sciences) beyond the level of mere aesthetic appreciation" (Hose 1995, p.17). Therefore, geodiversity interpretation focuses on communicating the significance of the geological resource or geosite to visitors. As such sites may be easy and interesting to geoscientists, they are generally hard for non-specialists. Thus, the main task should be explaining the meaning and significance of geological sites to the tourists that visit.

Figure: Organised visit of geoscientists and geo-lovers to remarkable and unique loess-palaeosol sequences in Ruma brickyard on Fruška Gora Mountain (Photo: Dj.Vasiljević)

The case study of this work is Autonomous Province of Vojvodina, a region in northern Serbia, located in the south-eastern part of the Carpathian (Pannonian) Basin and encompassing the confluence area of the Danube, Sava, and Tisa rivers. Serbia is a country with long history of nature protection, having roots even in the 14th century. Unfortunately, this long lasting tradition has not resulted in efficient and stabile conservation system, as only 518,200 hχ or 5.86% of its territory is under governmental protection, which is amongst the lowest percentages in Europe. Vojvodina region follows this trend

with total protected area of 5.47 % within 131 protected assets (1 National Park, 13 Special Nature Reserves, 8 Strict Nature Reserves, 91 Natural Monuments, 2 Landscapes of Outstanding Features, and 7 Nature Parks). Geoconservation and geotourism are still new and unclear terms, which are poorly and insufficiently practiced in this area. This resulted in only 9 geoheritage sites - protected assets due to its significant geodiversity. Seven of them are within Fruška Gora National Park with Deliblato Sands and Titel Loess Plateau remaining outside this area.

It is more than evident that "Cinderella effect" is also present in this region, with far more concern on living part of natural environment. Infrastructure, logistics and expertise on geoconservation is still in its initial stage or very poor (Hose & Vasiljević 2012). Therefore, this study presents an overview of the most valuable geoheritage of the Vojvodina region with an insight into the general condition of these areas through their geoconservation issues, visitor management and geotourism. Great consideration will be put on current problems and proposals on improvement and initiation of geoconservation and geotourism of the presented area.

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SESSION 5D VISITOR MOTIVATION AND EXPERIENCE

Preferences for and perceptions of nature experiences in mountain forests and in urban green spaces

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Introduction

High quality nature experiences and less desirable alternatives

Many people moved from rural areas to cities, after the industrial revolution. In doing so, they found themselves separated from the natural world. The loss of this aspect of their former lives motivated people to look for opportunities to re-establish a relationship with nature (Kuester 1999). Today, modern states are attempting to provide the authentic nature-based experiences being demanded by urban dwellers. Many European cities have responded by establishing and securing urban green spaces, and citizens are going out of their way to enjoy the interactive experiences made possible by these efforts.
The objective of those wishing for a return to pure nature is focused on access to forests, and especially mountain forests, which are perceived as providing the ultimate model of a desirable nature experience. Urban green spaces are perceived as being a less desirable alternative to a high-quality nature experience.

Changing perceptions and preferences with regard to nature experiences

The design, philosophy, and management of urban green spaces have changed dramatically over time. For example, a forested area of 6,400 ha in 2,500 urban green spaces is being established in Berlin, Germany, where 84.5% of citizens visit the urban forest at least once a week (GALK 2010). Data from 1980 showed that only 24% of city residents had visited the forest once a week in that year (Loesch 1980). The marked differences between the urban forest use patterns at these two points in time raises questions as to why the frequency of visits has increased.

Have the expansive changes undertaken—such as increasing the area of urban forests, developing management techniques and improving facilities—changed urban dwellers' perceptions toward nature?

This research aims to answer this question. In the past, forests served as the ultimate model for nature experiences. This study examines how urban dwellers' images of forests have changed over time, as urban green spaces have changed. In other words, are mountain forests still the ultimate goal of those wishing for a return to pure nature? To answer this question, the researchers conducted a survey of urban dwellers who visited mountain forests and urban green spaces in three Western European cities, each of which has a long history of promoting nature-based experiences for their urban residents. This study investigated respondents' perceptions of their experiences with nature, using an attitudinal rating scale survey.

The hypotheses used for this study were the following:

- Urban dwellers prefer mountain forests over urban green spaces, and perceive direct experiences with nature in mountain forests as having the highest quality.
- People's levels of satisfaction with outdoor recreational activities in mountain forests, and their perceptions of how these experiences benefit their health, are far more positive compared to the experiences of those who visit urban green spaces.
- Urban green spaces are still considered second best to mountain forests, but the gap is gradually becoming smaller.

Materials and Methods

Survey area and target group

To quantify the differences between how nature experiences in mountain forests and urban green spaces are perceived, this study used a destination interview survey, targeting local residents from Vienna (Austria), Zurich (Switzerland), and Freiburg (Germany), who had visited one or more of the eight target areas. The target areas had been selected with the help of local university research teams, and included mountain forests and urban green spaces frequently visited by citizens. Approximately 35 people were interviewed per target area, and data were collected from 300 people. The sample group surveyed was selected randomly from the people who visited the areas. The survey was conducted between 10 a.m. and 6

p.m. in July and August 2012. The average response rate was 30%.

Survey methods

The one-on-one expert interview method (Meuser and Nagel 1991) was used, to avoid introducing errors that would result from insincere responses, or errors of interpretation that might result from using written questions and responses. The interview was conducted in the form of a conversation, using a local language version of the study survey. If the meaning of a statement was not conveyed accurately, or understood by the interviewee, the intention was clarified during the conversation. In this way, errors of over- and under-interpretation were avoided.

Interview survey

The survey was divided into three categories, in order to investigate the differences in urban dwellers' perceptions of, and preferences for, mountain forests versus urban green spaces, as well as their levels of satisfaction with their nature experiences. The three categories used were: (1) evaluation of the quality of the nature experiences at the places visited, (2) level of satisfaction with the recreational activities experienced, and (3) perception of the extent to which the respondent experienced health benefits at the places visited. The questionnaire was modelled on the Likert rating scale, which is used to measure attitudes. Twenty-three statements regarding mountain forests and urban green spaces were developed, and each fixed choice response was assigned a numerical value. Respondents were asked to indicate to what extent they agreed or disagreed with each of the statements. Researchers analysed the results to find midpoints or means of observed values. A t-test was used to compare the mean values of the different attitudes, and further analyses were conducted to determine whether the differences did or did not support the hypotheses.

Results and discussion

Survey results regarding the quality of nature experiences showed that on average, the quality of nature experiences in mountain forests was higher than the quality of nature experiences in urban green spaces. Differences between the two experiences were not found to be statistically significant in all areas surveyed.

Respondents in Zurich reported a higher number of 1.61 on average, for their experiences in mountain forests, compared to their nature experiences in the urban green spaces. The statistical significance of this difference was confirmed, with the t-test value of $p = .004$. Mountain forests were given a higher value than urban green spaces by a difference of .79 in Freiburg ($p = .041$).

Satisfaction with outdoor recreational activities in mountain forests versus outdoor experiences in urban green spaces showed that the hypothesis that peoples' levels of satisfaction and perceptions of mountain forests as being more positive, compared to urban green spaces, was not valid in all surveyed areas. It was found that levels of satisfaction from recreational activities were higher in urban green spaces for all three cities. This can be explained by the high-quality urban green space experience, along with the ready accessibility and amenities provided by modern urban green spaces. The t-test of these results showed that there was no statistically significant difference, between the levels of satisfaction experienced from recreational activities conducted in mountain forests, and activities conducted in urban green spaces.

The evaluation of health benefits in currently visited places also showed that visitors experienced no statistically significant difference in their perception of the benefits gained by visiting urban green spaces and mountain forests. This finding is contrary to the research hypothesis that respondents would perceive greater health benefits from mountain forests than from urban green spaces. The questions were organized around the effects on psychological health and the effects on physiological health, but there was no statistically significant difference between the responses. However, all t-test results had a value of $p = 0.05$, which does not allow rejection of the hypothesis, and so indicates there was no difference.

The recreational motives of visitors showed diverse motives and activities, including forest environmental education, sports and wildlife watching, walking with companion animals, learning, experiencing nature, meditation, and even taking a break during office hours. But their main motivation was refreshment and relaxation; therefore there are no big differences of two different areas significantly.

Table. Survey results regarding the quality of nature experiences, satisfaction with outdoor recreational activities and health benefits.

Vienna	**Mountain Forest**	**Urban Green**	**t value**	**Sig.**
Nature experience	4.41	4.02	1.364	.180
Recreational activity Satisfaction	4.68	4.78	-.616	.541
Facility and management satisfaction	4.28	4.54	-1.214	.271
Psychological health	4.68	4.93	-1.154	.259
Physiological health	4.65	4.58	.231	.819
Zurich	**Mountain Forest**	**Urban Green**	**t value**	**Sig.**
Nature experience	4.48	2.87	4.296	.004
Recreational activity Satisfaction	4.80	4.87	-.322	.750
Facility and management satisfaction	4.28	4.57	-.766	.451
Psychological health	4.50	4.43	.113	.911
Physiological health	3.80	4.29	-1.150	.262
Freiburg	**Mountain Forest**	**Urban Green**	**t value**	**Sig.**
Nature experience	4.09	3.30	2.188	.041
Recreational activity Satisfaction	4.36	4.70	-1.302	.209
Facility and management satisfaction	4.04	4.22	-1.190	.249
Psychological health	4.91	4.90	.067	.947
Physiological health	4.91	5.00	-.951	.353

*Mountain Forest: Wienerberg(Vienna), Zurichberg, Uetliberg(Zurich), Schlossberg(Freiburg)
*Urban Green: Stadtpark, Donauinsel(Vienna), Backeranlage(Zurich), Stadtgarten(Freiburg)

Conclusion: Summary of research findings

While visitors perceived that there was a difference in the quality of the natural landscapes and the nature experiences in urban green spaces and mountain forests, they indicated no differences in their satisfaction levels between recreational activities conducted in mountain forests or in urban green spaces. There was no difference in their assessment of the management and facilities at either site, and they felt that both sites offered the same positive health benefits. The hypotheses of this study were found to be invalid, with the exception of the first item, regarding the quality of the nature experience.

These findings can be explained by the fact that urban dwellers' perceptions of nature-based recreational activities, curative effects, and the quality of their experiences in nature have been diminished, as regards their ability to perceive the differences between urban green spaces and mountain forests. They also experience less stress when visiting urban green spaces, because these spaces are readily accessible.

It is thought that people's once-heightened sensitivity to the differences between modern urban green spaces and mountain forests has been muted, as a consequence of the diverse advantages of the former. In other words, urban dwellers get sufficient levels of satisfaction, and extremely positive perceptions of the health benefits, from spending time in urban green spaces. The results of this study show that mountain forests are no longer regarded as the preeminent nature experience, in terms of health benefits or satisfaction from recreational activities. Aside from their significance as pure natural landscapes, they no longer serve as a model.

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From landscapes to lightscapes: indicators and standards of quality for night sky viewing at Acadia National Park

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National parks in the United States were established to protect the country's monumental landscapes. But the meaning of these landscapes has evolved over time. Initially, parks were conceived primarily as scenery and tourist attractions. Later, historical and cultural landscape values were recognized. With the birth of the science of ecology, park landscapes took on important natural significance. At the beginning of the twenty-first century, the meaning of national park landscapes is being extended again to include soundscapes (the sounds of nature uninterrupted by human-caused noise) and lightscapes (environments characterized by the cyclic rhythm of the sun and moon and dark nights unperturbed by artificial light).

The emerging importance of lightscapes or night skies is a function of a growing consciousness about their values and a crisis over their steady disappearance. For millennia, people have "gazed upon the cosmos" in their enduring efforts to understand both the physical and metaphysical worlds. Human biology and culture are organized around the movement of the solar system, observations of the night sky are embodied in the religions and mythology of cultures around the world, and the celestial world has been the inspiration for art, literature, and other forms of cultural expression. "Sleeping under the stars" remains an important ritual of coming of age in the contemporary world. Unfortunately, the night sky is disappearing due primarily to "light pollution", human-caused light that reduces the brightness of the stars. National parks, especially those far from urban areas, are some of the last refuges of dark night skies, and the importance of night skies is increasingly reflected in National Park Service (NPS) policy. The NPS established a Night Skies Program in 1999 and a recent NPS report designed to guide the agency in its next century includes a recommendation that the NPS "Lead the way in protecting natural darkness as a precious resource and create a model for dark sky protection".

To help inform management of night skies in national parks, a program of research is being conducted at the University of Vermont in collaboration with Clemson University and the NPS. Part of this program of research includes two surveys of visitors to Acadia National Park to identify indicators and standards of quality for night sky viewing. Indicators and standards of quality are important elements of contemporary management-by-objectives frameworks for parks and outdoor recreation (Stankey *et al*. 1985; National Park Service 1997; Manning 2001; Manning 2007). Indicators of quality are measurable and manageable variables that are used as proxies for management objectives and standards of quality are the minimum acceptable condition of indicator variables (Manning 2011).

The first survey was conducted in the summer of 2012 and asked visitors to report what elements of the night sky were seen and not seen and to evaluate how this affected the quality of their park experience. Data were organized into an importance-performance grid to identify potential indicators of quality (Figure 1). Findings suggest that the ability to see celestial bodies such as stars and the Milky Way are important indicators of quality. The second survey was conducted in the summer of 2013. A representative sample of visitors was presented with a series of nine photographic simulations of the night sky at Acadia representing a full range of brightness of the stars and other celestial bodies. Respondents rated the acceptability of each of the simulations, and resulting data were graphed to form a social norm curve. The point at which the norm curve crosses the neutral point of the response scale (crosses from the acceptable range into the unacceptable range) represents a potential standard of quality. Respondents were also asked to report which photo 1) they preferred to see, 2) showed the maximum amount of human-caused light the NPS should allow, and 3) showed the amount of human-caused light that would cause them not to visit Acadia for night sky viewing. These and other study findings can help inform NPS management of lightscapes or night skies. For example, managers might reduce artificial lighting in parks, work with surrounding communities to reduce "light trespass", and offer more programming for visitors that emphasizes the importance of the night sky and where, how, and when to observe it.

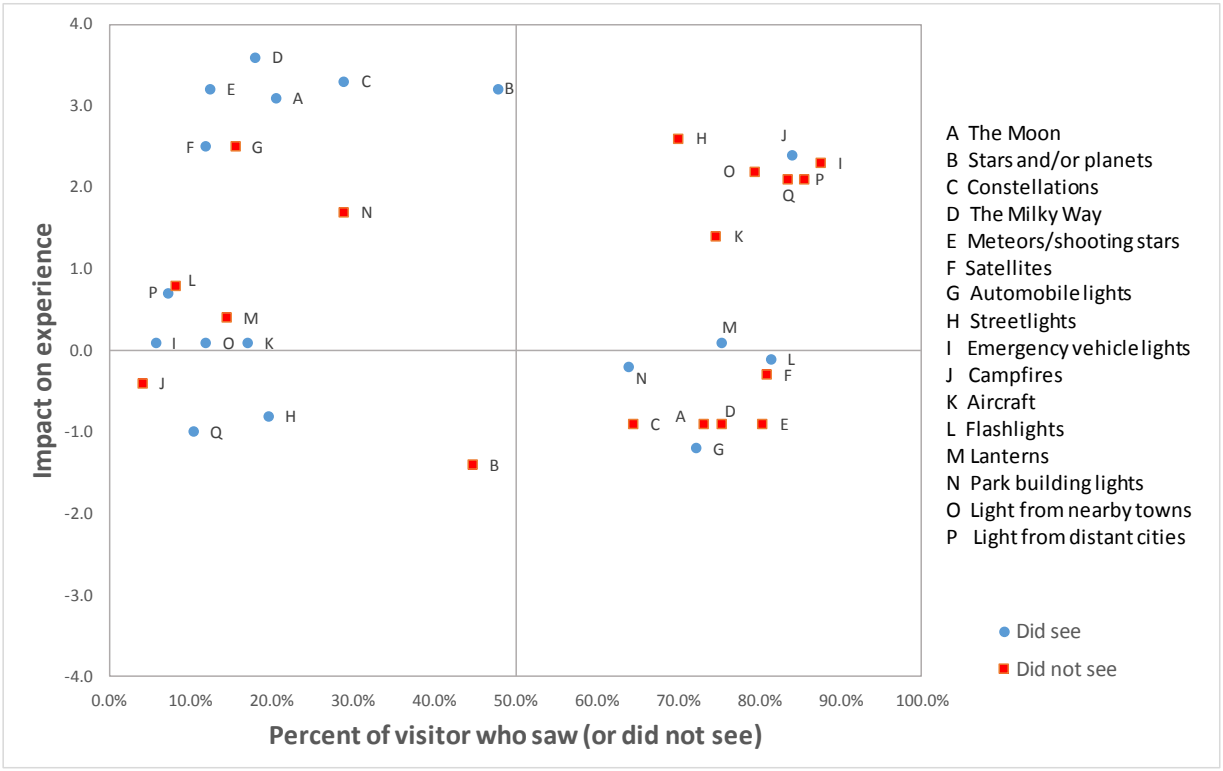

Figure 1. Importance-performance analysis of items seen and not seen by visitors.

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Outdoor recreation motivations and nature experiences: the case of Eskişehir

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Introduction

Human nature activities based on outdoor recreation are considered as a social phenomenon having various effects in different areas such as tourism, sport and education. The behavioural relations form an important aspect in order to understand in what ways nature activities are related to outdoor recreation in theory and to examine its' relation to leisure marketing. This study aims at examining the relation between nature experience and outdoor recreation motivation as an important determinant of experiences.

Basically, motives and experiences are similar terms. In the literature it is emphasized that the factors symbolizing experiences correlate with factors of motives closely, and we need more research to explain the relationship between motives and experiences (Mehmetoglu and Engen, 2011; Oh, Fiore and Jeoung, 2007). Our research specifically focuses on the question of what dimensions these factors correlate with. For this purpose, *Experience Preferences Theory (REP)* was applied to determine the outdoor recreation motivation and *Experience Economic Theory* was applied to determine the nature experience.

Theory

Experiences are considered as economic values in modern economy. Pine and Gilmore's Experience economy model is tested to explain the nature of experience. The dimensions of the model are the customer *participation* occurring as active and passive and *connection* occurring in the form of absorption and immersion. Four areas of experience, namely *entertainment, education, aesthetics* and *escape* have emerged with these dimensions. Rich experiences consist of the features of these four areas.

In the outdoor recreation literature, Driver and Tocker (1971) developed *REP* for measuring desired goal status that are attained through participation in leisure (Manfredo *et al*, 1996:188). The basis of the theory is to realize particular psychological and physical aims of the recreation behaviour. According to the model developed based on the expectation theory, the expectations relating to the recreation activities provided to realize performance which a person wants to achieve.

Methodology

The sample of the study included those who perform outdoor activities such as trekking, mountaineering, cycling, handling fishing, nature photography, and water sports individually or as a group in Eskişehir, Turkey. *Two-Dimensional Experience* scale developed by Oh *et al*. (2007) and *REP* scale developed by Driver and Tocker (1970) were used for the purpose of the study. The main survey was completed from December 2012 through May 2013, and 349 questionnaires administered personally and an internet survey was conducted. Data were assessed by examining outliers, missing data, normality, multi-collinearity, singularity and problematic questionnaires were excluded from the further analysis. In total, 313 questionnaires were analysed and explanatory factor analysis, confirmatory factor analysis and structural equation modelling were applied.

Results

The exploratory factor analysis of 24 items showed that participants were motivated by *relaxation, learning and sociality, independence and personal development, achievement* factors in outdoor recreation activities (Cronbach Alpha: 0,908, Explained Variance: 46,206) and nature experience consists of *aesthetic, education* and *escape* dimensions (Cronbach Alpha: 0,781, Explained Variance: 60,692). On the other hand, *entertainment* dimension, which was passively absorbed, was not statistically significant. Factor structures were verified by confirmatory factor analysis. Motivation factor structure demonstrated acceptable fit (x^2/df: 2.71, RMSEA: 0.074, NFI: 0.93, NNFI: 0.95, CFI: 0.95, SRMR: 0.064). Nature experience factor structure demonstrated good fit (x^2/df: 2.5, RMSEA: 0.071, NFI: 0.96, NNFI: 0.96, CFI: 0.97, SRMR: 0.045).

The relationship between the experience factors and the motivation factors was tested by structural equation modelling. As seen in Figure 1, a positive significant relationship was found between *education* experience and *learning and sociality* motivation ($\gamma = 0.96$, $t = 7.66$, $p < 0.001$). *Learning and sociality* motivation explains 96 per cent of *education* experience. *Education* experience was negatively related to *relaxation* motivation ($\gamma = -0.28$, $t = 2.48$, $p < 0.001$). This relationship is statistically significant but weak. On the other hand, a positive significant relationship was found between *aesthetic*

experience and *learning and sociality* motivation (γ = 0.47, t = 3.81, p < 0.001). Finally *escape* experience was positively and significantly related to *independence and personal development* motivation (γ = 0.41, t = 3.04, p < 0.001). Based on fit indicators (x^2/df: 2.184, RMSEA: 0.08, NFI: 0.90, NNFI: 0.95, CFI: 0.95, SRMR: 0.06), the measurement model appeared to fit the sample data acceptable level.

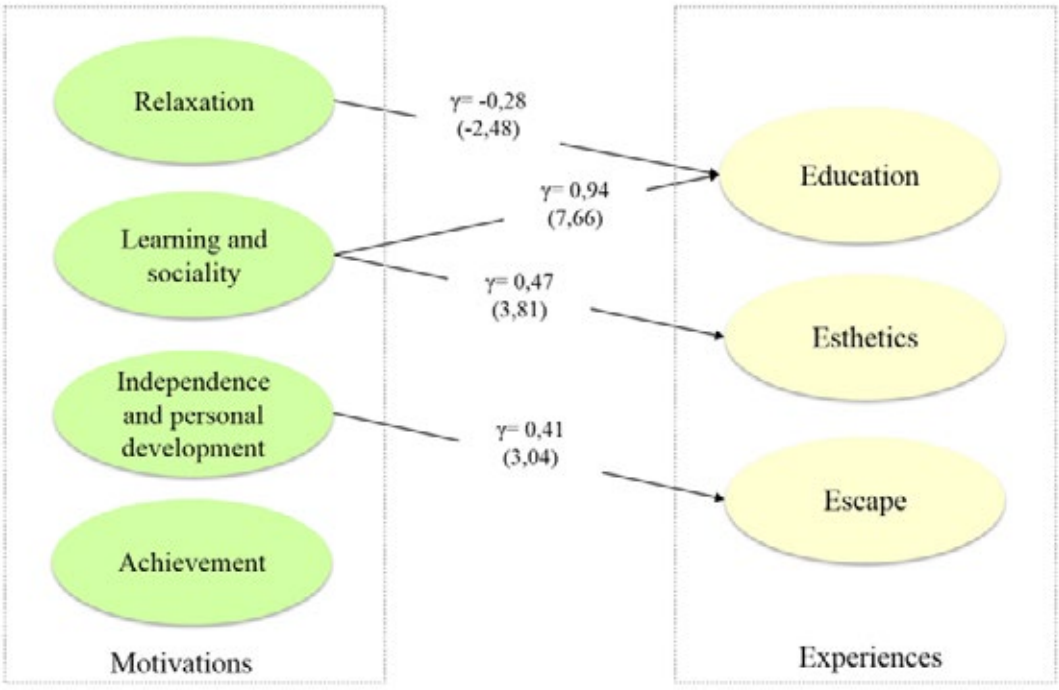

Figure 1. Relationships between outdoor recreation motivations and nature experiences

Conclusions

This study focused on the relationship between motives and experiences. According to REP theory used to measure motives, experience is an intended psychological output. Hence, it is seen that experience and motivation factors are related. However, achievement motive does not directly correlate with the nature experiences.

Study results can be useful for both recreation and tourism practitioners to improve exchange relation in market. In this vein, the relationship of the factors' structure should be taken into consideration while designing the nature experiences for the target markets.

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Assessing restorative qualities of a wilderness park from the perspective of environmental psychology

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Introduction and aim of research

Need for restoration

In many western, industrialized countries, daily life is defined by high workload, stress, and a sedentary lifestyle. A vast body of literature provides evidence that this lifestyle is associated with, for example, growing incidences of diseases and a higher overall mortality (e.g., Kopp and Rethelyi, 2004; Krantz, Berntsson, & Lundberg, 2005).

Maintaining or increasing health and well-being becomes thus a major challenge for society. Recent research on restorative environments suggests that recreation especially in natural environments can be associated with increased well-being and health (e.g., Bowler *et al.*, 2010; Abraham *et al.*, 2010). Well-being benefitting effects of recreating in natural settings can often be explained by restoring psychological resource needed to willful direct attention. An additional source for maintaining health and well-being may also be found in psychological need satisfaction. In self-determination theory it is assumed that satisfaction of the basic psychological needs autonomy, competence, and social relatedness can be associated with positive well-being (e.g., Deci & Ryan, 2008).

Aim of research

The present study aimed at assessing restorative qualities of visiting the Wilderness Park Zürich (Switzerland). Main objectives were to analyze psychological aspects that impact evaluation of the park and perceived restoration of visits.

Methods

Study Area

The study was conducted as an on-site visitor survey at the Wilderness Park Zürich. The park covers a total area of about 12 km2. It comprises of forestland, wilderness, and inherits animals. A visitor centre provides food and drinks, contains a museum and offers a resting place for visitors. A new outdoor playground for children was built in front of it, and several places to make campfires and prepare food are close to the visitor centre. Thus, the visitor centre provided a good location for conducting the survey.

Procedure and measures

The study took place on three weekends in autumn of 2012. Weather conditions were fine and comparable for all days during the field phase. At those weekends when the study was conducted, a total of two researchers were present for the whole day. They were instructed to engage every visitor at the visitor centre or at nearby places. As an incentive, visitors were offered a hot drink of their own choice (coffee, tea, etc.) and they received a small piece of chocolate after completion, which took approximately 15 minutes. Groups were provided one questionnaire per person.

The on-site questionnaire contained items about perceived restoration while at the park, perceived stress, satisfaction of psychological needs, socio-demography, and general aspects of visiting behaviour. If not otherwise indicated, all scales ranged from -2 (negative) to +2 (positive) and included a neutral option (0). The results of an on-site pre-test suggested that no changes needed to be applied to the questionnaire.

Sample

Data from 142 visitors were collected within three weekends. After data-screening, 26 cases had to be excluded for various reasons (e.g., working instead of leisure time, no need for restoration). The total sample comprises of data from N = 115 visitors. Mean age was 44.0 years (SD = 12.8 years), 59.5% were female, 33.9% male, and 6.6% did not indicate their gender. The level of formal education was rather high: 42.3% graduated from university or technical college (primary school: 2.7%; vocational school: 22.5%; high school: 11.7%; higher educational training: 18.9%). Most visitors were accompanied by a partner (60%), and 28.3% had children with them. Only 10% visited the park alone.

Results

Main motives for visiting were experiencing nature (M = 1.7, SD = 0.4), followed by social motives (M = 1.13, SD = 0.9). On average, visitors reported satisfaction of basic psychological needs (autonomy: M = 0.7, SD = 0.7; competence: M = 0.7; SD = 0.7; social relatedness: M = 0.3, SD = 0.8) and positively evaluated the park visit (M = 1.5; SD = 0.5). Need satisfaction correlated positively with evaluation of the park visit ($r = .25$, $p \leq 0.01$).

Mean sum score for self-reported perceived stress in everyday life was 13.6 (SD = 6.1; items ranged from 0 (never) to 4 (always)), which is within the norm reported in literature. Participants stated that they felt on average more recovered (M = 1.1, SD = 0.7), relaxed (M = 1.1, SD = 0.7), happy (M = 1, SD = 0.8), healthy (M = 0.8, SD = 0.8) and less stressed (M = -0.9, SD = 1) after the visit. However, the more respondents experienced interdependencies between stressful events and the park visit, the less restoration they reported – mainly due to an impaired sense of being psychologically away.

Concluding remarks

The results suggest that satisfaction of basic psychological needs can be associated with a positive visiting experience. Additionally, perceived restorative outcomes may be influenced by presence or absence of stimuli that are associated with daily demands. Creating a superior visiting experience may therefore mean to lower possible interdependencies with stimuli that are associated with demands (e.g., by recommending to leave mobile phones at a safe place in the visitor centre), and by providing opportunities that help people satisfy their needs for autonomy, competence, and social relatedness.

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SESSION 6A URBAN OUTDOOR RECREATION

Integrating multiple societal demands into urban forestry for the future: the case of Munich (Germany)

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Introduction

Socio-cultural ecosystem services (ES) like aesthetic enjoyment or suitability for outdoor recreation activities are considered to be extremely important in urban forests (Tyrväinen *et al*. 2005). Adaptive management strategies strive to secure important provisioning (e.g. timber) and regulating (e.g. filtration, lowering temperatures) ecosystem services (ES). Consequences of these management actions like conversion of conifer stands towards structured multilayer stands containing different broadleaf and conifer species might have effects on these socio-cultural ES.

Also, the demand for socio-cultural ES might change. While urban population still increases, at the same time, demographic change leads to a higher share of older citizens. Moreover, a diversification of lifestyles with their corresponding attitudes, values and communication channels is expected. Finally, the share of persons with a migration background increases. Using the case of urban proximate forests in Munich, a number of key questions arise:

- What are current recreation patterns in urban forests and do different groups have different demands?
- Does adaptive management of forest stands affect perceived scenic attractiveness and the quality of recreation?
- How can different groups of society better participate in forest recreation? Which barriers exist?
- How can forest authorities react to these demands?

Methods

A set of different studies is carried out. First, urban proximate forest recreation patterns, forest preferences, and recreation demands are assessed (Weitmann and Korny 2014) and results are compared with studies dating back in the 1980ies (Ammer *et al*. 1982 and Lindenau 1996) and inter-area comparisons of different forest types (spruce dominated forests in the south of Munich with pine and broadleaf dominated ones in the north). Forest landscape perception and preferences are assessed and compared using lifestyle concepts (Lupp and Konold 2008). Special focus is drawn to assess demands and preferences of persons with migration background. Finally, participatory scenario work using methods described by Syrbe *et al*. (2013) and Starick *et al* (in print) with urban forest stakeholders are developed considering different driving factors, resulting management strategies and impacts on socio-cultural ES.

Results

First results indicate that uses diversified in the past decades. Larger different user groups in urban proximate forests are dog walkers, hikers/strollers, Nordic walkers, joggers, and bikers with own distinct user patterns and distribution across the forests. Also traveling patterns for accessing urban forests have changed. Access by bike has increased from 33% in 1979 to 50.1% in 1995 and 58.3% in 2013, while the share of car use has dropped from 53% to 30.5% in 1995 and 24.1% in 2013. Biking is nowadays the most important recreation activity with 72.7% (42.3% in 1979), while taking a walk/hiking has dropped from 68.5% to 53.7% in the past 35 years. Picnicking dropped from 29.9% to 18.9% between 1979 and 2013. Also a shift towards older groups of society can be observed. While around 20.6% of the interviewed visitors were over 46 years old in 1979, and 35% in 1995, this group already formed 55.1% in 2013. Visitors in the riparian forests preferred old poplar stands as well as noble broadleaf forest types.

Key driving factors influencing the future development of the urban proximate forests identified in an expert workshop are: climate change, demand for wood, increased demand for wood used for energy purposes, increased outdoor recreation and diversifying activities, increased concern for forest protection, increased use of information but at the same time decreasing knowledge about forest ecosystems and their use, demographic change. These driving forces were bundled to develop three stringent forest management scenarios: “Multifunctional”, “Urban Park” and “Wood production”.

Discussion

The increased bike use for both access and recreation is surprisingly high also in comparison with other cities and first results from other urban proximate forests in Munich. A shift to preferences of mixed and broadleaf forests can be seen also

in other studies (e.g. Lupp and Konold 2008) and reflects lifestyle changes with respective mobility patterns and aesthetic preferences.

Further work

In the next steps, these scenarios will be analysed. A core issue will be the socio-cultural ES suitability of these forests for outdoor recreation and aesthetic enjoyment. Nevertheless, simple analyses considering also other ES shall be carried out.

Authorities managing urban forests will have to reflect their communication channels to address recreationists and management towards climate change. While forest management seems to be necessary to provide preferred forest stands, management activities like harvesting are not.

Acknowledgements

The work was funded by the Bavarian Ministry for Nutrition, Agriculture and Forestry. The authors would like to thank Valerie Kantelberg, Marc Koch, Roland Schreiber and Christoph Schulz from the LWF brining in their expertise in the first scenario workshop.

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An analysis of the factors affecting the landscape appreciation of urban parks. A research in the Veneto region (Italy)

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Introduction

Several studies have highlighted that urban parks have an important restorative function and contribute to improving the physical and cognitive status of residents (Kaplan & Kaplan 1989; Ulrich 1981). There is also a close relationship between the aesthetic features of the landscape and the restorative function that it is able to perform (Hartig & Staats 2006).

The past studies have found that some factors generally enhance the aesthetic features of urban parks (presence of water, tall trees and lawns), while others tend to worsen them (degraded areas that are poorly maintained, modern buildings inside or outside the park) (Noralizawati & Noriah 2012; Schroeder 1990). However, these studies often overlooked the potential presence of heterogeneity in the aesthetic preferences of the urban parks' users.

To analyse the presence of heterogeneity a latent class analysis approach may be particularly useful because it allows respondents to be grouped according to their latent system of preferences and not on the basis of their objective and observable characteristics (Sevenant & Antrop, 2009).

The purpose of this research is to verify, by means of a latent class analysis, whether and to what extent the value attributed to the aesthetic quality of the landscape will change significantly between groups of potential visitors to urban parks in the Veneto.

Methodology

To analyse the landscape preferences of urban parks in the Veneto region the psycho-physical method was used. The estimate of the relationship between the landscape elements and respondents appreciation was performed using a latent class approach or Regression Mixture Analysis.

In the late spring of 2013 more than 900 photos were taken inside eleven urban parks, from which 57 images were selected for evaluation. 150 students attending the course of Land and Landscape Restoration and Enhancement of the University of Padua were interviewed in 2013. The images were projected onto a large screen for about 8 seconds. Interviewees rated their aesthetic quality using a 1 to 10 scale. By means of the ordinary least squares method, the regression function was estimated that related the scores with the percentage of the image occupied by the most important landscape elements that characterize the urban parks under analysis.

Results

All the variables in the base model are significant with 95% probability and the model is consistent with the findings of other studies (Table 1). Water (especially fountains) is the element that most improves the aesthetic quality of the landscape, followed, in order of importance, by lawns, flowerbeds and trees. Modern buildings outside the park instead have a strong negative impact, regardless of their architectural features. Modern buildings inside the park also have a significant negative effect, while the older ones reduce the aesthetic quality only if they are in a poor state of preservation. Inside the park, paths have a negative impact if they are paved or asphalted.

Considering the latent class model, the three classes selected are of about the same size (Table 1). The landscape preferences of the interviewees belonging to each class tend to be quite different.

The members of the third class prefer parks where natural elements are more present and where elements of human origin, whether they are buildings or asphalted or paved paths, are absent.

In contrast, members of the first class tend to tolerate the visibility of modern buildings more and appreciate the presence of trees and flowerbeds less than the others.

In conclusion, the investigation has revealed that the aesthetic quality of urban parks is largely determined by their degree of naturalness although the tolerance of anthropogenic elements can vary widely between park visitors. The results of the research suggest the necessity to carefully plan the urban parks in order to reduce the visibility of modern anthropogenic

elements located both inside and outside the parks. Moreover the designers should consider the opportunity of using mainly natural materials to pave the path or to build any kind of construction.

Table 1 The Regression Mixture Model estimated

	Class 1		**Class 2**		**Class 3**		**General model**	
Class proportion size	32.9		36.5		30.57		100.0	
N	2744		3080		2576		8400	
	Coeff.	sign.t	Coeff.	sign.t	Coeff.	sign.t	Coeff.	sign.t
Constant	2.0132	0.0000	1.8202	0.0000	1.7525	0.0000	1.8631	0.0000
LN Water	0.0184	0.0009	0.0216	0.0046	0.0422	0.0058	0.0269	0.0000
Ln Fountains	0.0261	0.0026	0.0361	0.0087	0.0489	0.0181	0.0367	0.0000
Ln Modern	-0.0428	0.0000	-0.0503	0.0000	-0.1344	0.0000	-0.0736	0.0000
Ln Deteriorated	-0.0409	0.0000	-0.0428	0.0001	-0.0818	0.0002	-0.0541	0.0000
Ln Tall Trees	0.0111	0.0012	0.0213	0.0001	0.0216	0.0163	0.0180	0.0000
Ln Other Trees	0.0113	0.0205	0.0276	0.0003	0.0260	0.0594	0.0218	0.0000
Ln Shrubs	-0.0092	0.1576	-0.0061	0.4876	-0.0442	0.0063	-0.0188	0.0001
Ln Flowerbeds	0.0161	0.0449	0.0348	0.0201	0.0377	0.0695	0.0295	0.0000
Ln Herbaceous	0.0092	0.0445	0.0146	0.0447	0.0130	0.3420	0.0123	0.0004
Ln Lawns	0.0284	0.0000	0.0418	0.0002	0.0513	0.0006	0.0403	0.0000
Ln Asphalted path	-0.0421	0.0000	-0.0583	0.0000	-0.0825	0.0000	-0.0604	0.0000
Ln Paved path	-0.0444	0.0000	-0.0514	0.0000	-0.0581	0.0367	-0.0512	0.0000
Ln Outside buildings	-0.0818	0.0000	-0.0995	0.0000	-0.1628	0.0000	-0.1130	0.0000
Sigma	0.1579	0.0000	0.2117	0.0000	0.3338	0.0000	0.2627	0.0000
r squared	0.2991		0.2822		0.2959		0.2423	

Legend

LN Water	natural log of the percentage of a view occupied by water bodies
Ln Fountains	natural log of the percentage of a view occupied by fountains
Ln Modern	natural log of the percentage of a view occupied by modern buildings in the park
Ln Deteriorated	natural log of the percentage of a view occupied by deteriorated traditional buildings in the park
Ln Tall Trees	natural log of the percentage of a view occupied by tall trees
Ln Other Trees	natural log of the percentage of a view occupied by other trees
Ln Shrubs	natural log of the percentage of a view occupied by shrubs
Ln Flowerbeds	natural log of the percentage of a view occupied by flowerbeds
Ln Herbaceous	natural log of the percentage of a view occupied by herbaceous plants
Ln Lawns	natural log of the percentage of a view occupied by lawns
Ln Asphalted path	natural log of the percentage of a view occupied by asphalted paths
Ln Paved path	natural log of the percentage of a view occupied by paved paths
Ln Outside buildings	natural log of the percentage of a view occupied by buildings outside the park

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Monitoring the number of urban forest visitors and their attachment in Sapporo, Japan

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Introduction

Urban forests not only provide physical and biological benefits, but also contribute to human well-being in urban environments (Dwyer *et al*., 1992). Recently, the social aspects of urban forests have garnered more attention from researchers and officials. The benefits of visiting urban forests constitute one of the ecological services of urban biodiversity. The increasing demand for and accessibility of urban forest settings have led to recreational impacts on environments and conflicts among various types of visitors (Arnberger, 2006). Managers and planners need precise data, including usage levels, demands and satisfaction of visitors. Eder and Arnberger (2012) also emphasized the influence of place attachment on visitors and their attitudes. Visitors who reported being more attached to a place were more sensitive to social and environmental site conditions.

There are 75 kilometres of trails in suburban Sapporo, Japan. The Sapporo City Office manages these trails for various activities for all age groups. Biological features, scenery, recreational facilities and accessibility vary across the trails. Increasing and diversifying visitor demands have made the management of the trails more difficult. To address these changing demands, the Sapporo City Office managers developed a research project to monitor the number of visitors throughout the year and to solicit information about their attitudes.

Method

We installed five pyroelectric infrared counters (EcoCounter) at two trailheads on Mt. Maruyama and three trailheads on Mt. Sankakuyama from December 2012 to November 2013. Each day, the counters made hourly recording of the number of hikers who entered and left the trailheads. Direct observations of visitors were conducted at each trailhead every three days in the winter, spring, summer and autumn. From dawn to dusk, the observers recorded the number of visitors, and their gender, age, clothes and possessions.

During this same period, we distributed mail-back questionnaires to hikers at Mt. Maruyama and Mt. Sankakuyama. These surveys solicited information about their demographic characteristics, frequency of visits, motivation for visits, place attachment and willingness to participate in voluntary trail maintenance activities. We received 821 valid responses, an effective response rate of 60.3%.

Results and Discussion

When we compared the number of visitors per hour as counted by the infrared counters and the observers, the correlation coefficient was greater than 0.9 at each trailhead. This indicates that the number of visitors recorded by the infrared counters throughout the year was highly accurate. Figure 1 shows the weekly number of visitors during the research period. Spring was the high season, and autumn was the next most popular period, but even in winter, there was a substantial number of visitors.

Fluctuations in the number of visitors varied between the trailheads. Multiple regression analyses showed that the factors that influenced the number of visitors also varied between the trailheads and among seasons. Commonly, the temperature and the day of the week had the strongest effects on the number of visitors.

Most of the visitors were residents of Sapporo, and they tended to come from neighbouring communities. We placed visitors into three categories based on the frequency of their visits: frequent visitors, periodic visitors and newcomers. Some of the frequent visitors hiked the same mountain trails every day for exercise, and they were more likely to live in nearby communities and be older. Periodic visitors were more focused on observing nature and sightseeing, whereas newcomers often visited to practice.

Frequent visitors reported stronger place identity with and dependence on the areas they visited. They also reported having more experiences and a greater willingness to participate in voluntary trail maintenance.

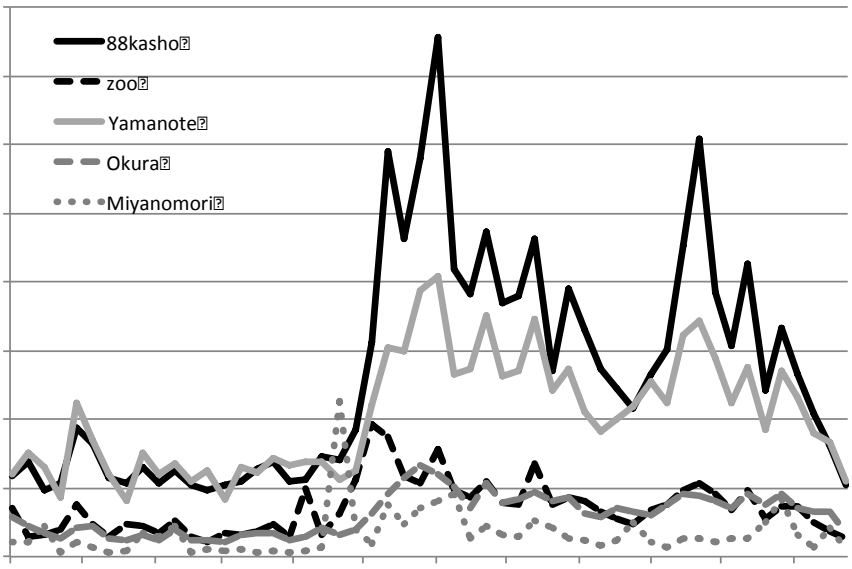

Figure 1: Weekly number of visitors counted at urban forest trailheads.

Conclusions

Pyroelectric infrared counters showed high accuracy in counting visitors to trailheads, and they made monitoring visitor use possible throughout the year. A certain number of urban residents visited nearby forests for exercise even in the winter when it had snowed. The factors that influenced the number of visitors varied between the trailheads. Factors that are important in remote protected areas differ from those that are important in suburban forest areas (Aikoh *et al.*, 2012), where the accessibility and convenience of the trailheads are the most important factors.

Visitors were classified into frequent, periodic and new visitors to the suburban forest areas. We found correlations between the frequency of visits, place attachment and willingness to participate in voluntary trail maintenance.

This information will be helpful to managers and officials, when they promote public participation in urban forest management.

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Urban mountain biking – multiple-uses of trails on the Uetliberg in Zurich, Switzerland

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Introduction

Over the last years mountain biking has grown significantly in all parts of Switzerland (Lamprecht *et al.*, 2008). In the proximity of the city of Zurich, the Uetliberg has become one of the most important recreational areas for mountain biking. Nevertheless, running, hiking and going for a walk are also important leisure activities, which have specific demands on the recreational environment. As a result of the increase in mountain biking activities, conflicts have arisen between bikers and hikers that use the same trails at the same time (Janowski *et al.*, 2002). In response to the vocal opposition to the growing mountain bike activities from hiking associations, the local mountain bike community founded the "Züritrails" association in 2010 in order to provide representation in discussions on mountain biking topics. To meet the challenges of the multi-use trail network on the Uetliberg, a usage concept was developed by Zurich city council in 2005. The objective was to partially separate biking and hiking activities from each other. The result was a separate bike-trail, which was built in order to relieve some of the pressure on the main trail network. During the cooperation with Züritrails, the need to define a clear strategy became obvious. This led to a joint analysis of the current situation with regard to mountain biking. The resulting baseline report on mountain biking in Zurich establishes important rules and describes further potential for improving the coexistence between mountain-bikers and hikers (Wadenpohl and Kenny, 2011).

This study measured further data concerning usage of the Uetliberg trails by bikers and hikers: A number of trails were analysed in 2012 in order to provide reliable information about the existing conflict potential between the different activities. Furthermore, the results are being used as a basis for political discussions and the implementation of additional necessary measures.

Methodology

Previous reports about the recreational use of the Uetliberg trail network show that conflicts mainly arise on the most frequented sections of the trail network (Wadenpohl and Kenny, 2011, Lannou *et al.*, 2011). As a first step, the trails were divided into different trail segments. On three characteristic trail sections, 201 on-site questionnaires were collected. A total of 161 of these were completed by hikers and could be used to evaluate their perceptions of the trail sections. Moreover, automatic cameras recorded activity on the trails. The pictures from two weeks (June 23-29 and August 18-24, 2012) were analysed to assess the types of activities on the different trail sections. On three additional trail sections, foot and bicycle traffic was recorded by automatic counters (eco-counter.com). Data from July 1 to October 31, 2012 was used for the analysis.

Results

Visitor numbers and the composition of activities differed clearly between the trails (see figure 1 for weekend days). Mountain bikers were detected on all the trails, even when they were very narrow and steep. Especially high numbers of bikers were counted on the multi-use trails in the proximity of the one-way bike trail (e.g. Schlittelweg). This could be explained by the high number of bikers cycling up before riding down the trail afterwards. Schlittelweg had the highest share of mountain bikers (35%) whereas all the other paths had a less than 15% share.

The numbers counted on weekend days were high and the period of peak activity for hikers and bikers overlapped at around 4 pm. On weekdays the numbers were lower with the number of mountain bikers increasing in the evenings after work, whereas the peak number of hikers was observed in the afternoon.

Generally, visitor numbers are heavily dependent on weather conditions. Thus the highest numbers for all activities were recorded on sunny summer weekends when the trails were used for multiple activities at the same time.

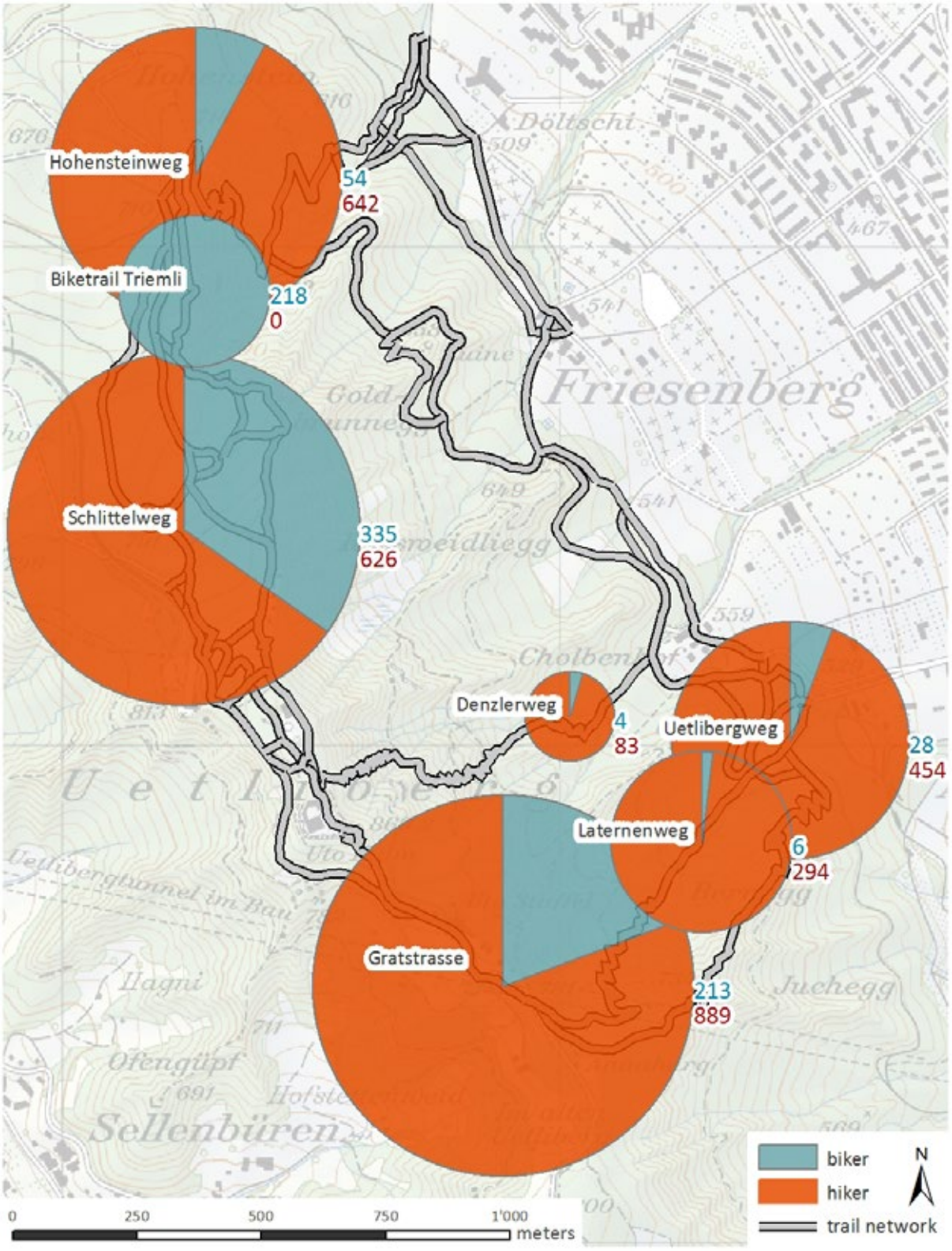

Figure 2: Average distribution of activities at the Uetliberg trail network on weekend days

In the on-site questionnaire hikers on Schlittelweg, Denzlerweg and Laternenweg were asked if they felt disturbed by other activities such as mountain biking, cycling, running, other hikers, dogs or noise on the corresponding segment of the path. The analysis showed that mountain biking (T-test, $p<0.001$) and cycling (T-test, $p<0.001$) had a significant effect on the interviewed hikers, whereas other activities, including other hikers, were perceived as less disturbing. On all the path segments, mountain biking was felt to be the most disturbing factor. Other hikers or runners were not perceived as disturbing by the hikers. The respondents pointed out the difference in speed between the activities – especially between hikers and mountain bikers or cyclists as the main reason for the conflicts. On Schlittelweg, the most used trail, respondents

generally felt more disturbed by people doing other activities.

Conclusions and management implications

Overall it can be said that on the Uetliberg, the potential for conflicts between hikers and bikers is high on multi-use trails on weekend days. Conflicts mainly occur due to the speed difference between the activities. Therefore the one-way bike trail takes some pressure off of the main trail network.

The local management has succeeded in easing the existing tension by implementing additional specific measures such as restrictions for bikers or sensitization campaigns. Today conflicts mostly occur because of illegal biking infrastructure, the improper use of footpaths, and home-made constructions. Despite this, the multiple usage of trails on the Uetliberg is mostly conflict free. Mutual consideration can help to calm the situation down on days of heavy usage. Providing information through different channels is therefore an important tool and can help to create a gratifying experience for everyone that uses the same paths at the same time.

The overall increase in bike sports is likely to continue not only in the city, but also in the countryside. Due to the population growth in and around cities there are likely to be increasing discussions on the provision of more infrastructure, such as official bike trails around cities. Therefore, information on the distribution of activities in recreational areas and specific trail use are a solid basis for political discussions and further monitoring of management measures.

Acknowledgements

We would like to thank the city of Zurich for their collaboration, field assistance and financial support.

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SESSION 6B CROWDING AND CONFLICTS

Assessing crowding perceptions and satisfaction among visitors at El Yunque National Forest, Puerto Rico

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Increased visitation is a major concern for many national parks and forests due to its implications for environmental quality and quality of the recreation experience. One could argue that crowding is among the most difficult problems faced by public recreation managers. Determining the level of recreation use beyond which the quality of the experience tends to decrease is a management issue and has received extensive attention in the outdoor recreation literature over the years (Vaske *et al.*, 1986; Shelby *et al.*, 1989; Manning *et al.*, 1999; Boxall *et al.*, 2003; Arnberger *et al.*, 2004). As suggested by Manning *et al.* (2001), crowding is a normative concept, which is influenced by a variety of conditions, which can be site specific. Crowding norms across social groups are formed as a result of social encounters and interactions occurring during a recreation visit. Without a doubt, continued concern exists over the effects of crowding on the quality of the outdoor recreation experience and visitors' satisfaction with recreation facilities and services.

El Yunque National Forest (EYNF) is the only tropical national forest in the national forest system and receives over one million visits a year. Although the forest managers enact a variety of recreation management actions to ensure recreation use of the forest is sustainable, limited information is collected by the forest in regard to visitation. Thus, the need to further study and explore the current situation as it relates to crowding and visitors' satisfaction with their recreation experiences while at the forest. Consequently, the purpose of this study is to assess visitors' perceptions of crowding and satisfaction with overall recreation experience and the facilities and services available at El Yunque National Forests' major recreation sites. In order to better capture crowding perceptions, the social interactions between the visitors are explored. Considering the variety of visitors the forest receives, the study captures differences between local visitors and tourists as it relates to crowding and satisfaction.

Visitor surveys (both in English and Spanish) were collected from 532 visitors in July 2013 at six different recreation sites within EYNF. Approximately half of the respondents (49.1%) were from Puerto Rico, while the other half were visitors from the United States (48.7%) and other countries (2.2%). The primarily purpose for visiting the forest was hiking/walking, nature viewing, and photography. Waterplay was another purpose for visiting the forest frequently chosen by the respondents. However, the local residents chose waterplay 11% more often than tourists.

The study participants were asked to report the extent to which they felt crowded while engaging in recreation at the forest. The majority of the respondents (63.2%) reported not feeling crowded while at the forest, even if more than half of the respondents (60.9%) encountered 31 or more visitors at the recreation site they most recently visited. When asked if the number of encounters at the site influenced their experience, 47.9% of the respondents reported the number of encounters as having no influence on their experience, 46.4% found the number of encounters as having a positive influence on their experience, while for only 5.6% of the respondents the number of encounters had a negative influence on the experience. When further analysing the data, differences could be observed between groups as it relates to the social encounters and interactions experienced during their visit (see Table 1). Primarily, differences based on residence and ethnicity were observed. The results showed the more tolerant groups to be the local visitors and the Hispanic population. Furthermore, differences on crowding perceptions were observed based on motivations for visiting the forest.

The participants were asked to rate on a scale from 1 to 9 the overall quality of the recreation experience at the site most recently visited. Overall, the participants rated highly the quality of their experience with an average of 8.56. This study did not find a significant relationship between crowding and the overall assessment of the recreation experience. However, when looking at specific items and visitors' satisfaction with various facilities and services at the forest, the respondents reported lower satisfaction levels with maintenance (signs of vandalism being present; clean restrooms), accessibility for people with disabilities, availability of facilities (picnic tables and grills, shelters, water fountains); parking, and signage and information services. Crowding might not have a direct impact on the overall satisfaction with the experience but indirectly contributes to satisfaction reported in relation to various facilities and services available at the forest. For example, parking becomes a major problem at the forest primarily during weekends and holidays when high levels of visitation are occurring. The observed relationships between crowding and satisfaction will be further discussed.

This study did not identify a strong crowding sensitiveness, the majority of the respondents reporting a low to moderate perception of crowding even if the number of encounters was high. Thus, the results re-emphasize the relevance of situational factors and visitor characteristics when examining crowding perceptions (Tarrant *et al.*, 1997; Manning *et al.*, 2001). The results capture significant differences between groups in their assessment of the current situation at the forest, primarily as it relates to social encounters and interactions. Our study complements previous work discussing crowding sensitiveness between different visitor groups (Boxall *et al.*, 2003; Grossmann *et al.*, 2004). This study calls attention to the diversity of groups recreation managers need to take into consideration when addressing crowding issues.

Furthermore, satisfaction with the experience and facilities and services at the forest are not to be ignored. The impacts of crowding can ultimately be translated to how the resource is being used and the extent to which the facilities and services provided are sufficient for the public. Even if the visitors do not necessarily report crowding as impacting their experiences, the indirect implications on facilities and services cannot be neglected. Thus, the social dimensions of outdoor recreation need to be constantly monitored in order to assure an effective management of the resource. Visitation is beneficial to the area but it needs to be managed in a sustainable way that will assure environmental quality and also quality recreation experiences for the visitors.

Table 1. Perception on Encounters based on Primary Residence and Ethnicity

	Primary Residence (%)				Ethnicity (%)		
	Puerto Rico (N=225)	United States (N=227)	Other (N=11)	**Total (N=463)**	Hispanic or Latino (N=313)	Not Hispanic or Latino (N=146)	**Total (N=459)**
Influenced experience in a positive way	56.0	37.8	36.2	**46.4**	54.0	31.5	**46.9**
Influenced experience in a negative way	4.4	6.2	18.3	**5.7**	3.5	8.9	**5.2**
No influence on experience	39.6	56.0	45.5	**47.9**	42.5	59.6	**47.9**
	chi-square=18.342; *df*=4; *p*=.001				chi-square=22.351; *df*=2; *p*=.000		

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Recreation monitoring in Brazil conservation units: a preliminary examination of trip characteristics, opinions, crowding, and satisfaction levels

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Jasmine C. Moreira, Ponta Grossa State University, Brazil

Background

Managing for high quality recreation experiences typically involves the use of traditional social carrying capacity variables; crowding, conflict, satisfaction, expectations and trip experience Shelby, (Graefe, Kuss & Vaske, 1990; Manning, 2011; Shelby & Heberlein, 1986). The purpose of this study was to conduct a pilot study on outdoor recreation use on Brazil Conservation Units using the social carrying capacity paradigm. Unlike the US, where many federal land agencies are split under either the Department of Interior or the Department of Agriculture, all Brazil Conservation Units (CU's) are managed by one single agency named the Chico Mendez Institute (ICMBio). There are over 320 CUs located within Brazil, offering a diverse supply of parks, protected areas, and reserves (Burns and Moreira, 2013). This pilot study includes data from the first year of a five year effort to develop an initial baseline of recreation monitoring data for Brazil's CU's. In future years, additional data will be collected in a systematic effort, using the same methodology. Data were collected in two Brazil CU's, the Tapajos National Forest, located in the Amazon region of Brazil, and the Campos Gerais National Park, in the state of Parana, in the south of Brazil. Campos Gerais NP (CGNP) is a newly designated national park, located in a highly productive agriculture area. The Tapajos NF (TNF) is located along the Tapajos River (a large tributary of the Amazon River). Data were collected over a period of three months (January—March 2014), which is the summer season in the southern hemisphere. Face-to-face data were collected using both clipboard and paper surveys and electronic tablet surveys. The interviewers were trained in data collection methodology by the co-authors. The survey days were stratified across weekday and weekend periods, as well as morning, mid-day and evening timeframes. A total of 145 surveys are included in this preliminary analysis (CGNP n=96 and TNF n=49).

Results.

A great deal of variation was seen in trip characteristics and trip quality across these two CUs. Though still significantly different, fewer differences were noted across the socio-demographic and "crowding" variables. Respondents at both CUs were more likely to be female (CGNP=55% female, TNF=59% female). TNF visitors were much more highly educated (80% bachelor's degree or higher) than CGNP visitors (29% bachelor's degree or higher). The mean age of respondents at both CUs was about 33-34 years. TNF visitors were much more likely to be first time visitors (75%) than CGNP visitors (50%), and respondents from both visited the CU an average of three times per year. The year of the first visit was more recent at the CGNP mean=2009) than at the TNF (mean=2004). Respondents at both areas were asked if they were aware they were on a federal CU. Nearly all of the TNF respondents (94%) knew they were visiting a national forest compared to just 47% of CGNP visitors knowing they were visiting a national park. Trip planning, however was very different, with nearly all (90%) of CGNP visitors planning their trip the day of or within three days of their trip. Just 51% of TNF visitors planned their trip within three days of the trip, while 27 percent planned between 1—3 months or more. Group size was higher at CGNP (5 people per group) than TNF (3 people per group), and virtually all visitors (97%) were in family/friends groups, compared to 78% of TNF respondents. Campos Gerais visitors were typically participating in only hiking/walking or swimming, while TNF respondents varied quite a bit in their activity participation (swimming, hiking, canoeing visiting communities, etc.).

When asked about their primary reason to visit, two different scales were used, thus creating a situation where they were not comparable. Nonetheless, this decision highlighted the great differences between an Amazon CU and a CU from the south of Brazil. Over half (58%) of CGNP visitors' primary reason to visit was to have contact with nature, and 31% to enjoy the place itself. Nearly half (45%) of TNF respondents, however, indicated their primary reason for visiting was to learn about the Amazon River culture and environment. Overall trip quality varied as well, with CGNP visitors rating their experience as 3.96 and TNF respondents rating their experience as 4.57 (using a 6-point quality scale). CGNP respondents also rated all of the quality indicators (cleanliness, trail condition, safety, etc.) significantly lower than TNF visitors. Finally, the perception of the numbers of other visitors was asked. In this case we made use of a scale that allowed respondent to report that the number of other visitors had a positive impact, neutral or a negative impact, rather than using the traditional 9-point crowding scale. Indeed, the numbers of other respondents resulted in a positive impact on 61% of TNF visitors and 39% of CGNP respondents. CGNP visitors were more likely to report the number of other visitors was a negative impact (18%) than TNF visitors (10%).

Discussion

We will discuss the differences noted between the recreation users in both locations in depth. While these data and corresponding findings are preliminary, they begin to lay a foundation of baseline data for future visitor monitoring. Campos Gerais visitors are very different than Tapajos National Forest visitors, in many ways. The settings are quite different, and the users themselves are quite different. Preliminary findings indicate that Campos Gerais visitor are more likely to be day users than over night users. Future data will be collected in both CU's that will allow us to develop user profiles; one of the strong desires of managers. We will also benchmark scales used in the surveys with other similar scales in the US and in central Europe.

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Oregon dunes national recreation area, USA: a trend examination of trip characteristics, crowding, and satisfaction levels (2002, 2006, and 2011)

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Robert C. Burns, West Virginia University, USA

In response to growing visitation and peak use congestion at certain sites within the Oregon Dunes National Recreation Area (ODNRA), Oregon, USA, USDA Forest Service officials from the Siuslaw National Forest identified a need to better understand the customers who use the area. After an initial survey of visitors in the summer 2002 recreation season, a follow up study was conducted during the summer 2006 and 2011 recreation seasons. Those follow up surveys were designed to closely resemble the initial survey and build on previous studies at similar coastal settings. On-site interviews were conducted with a total of 1842 respondents (442 visitors in 2002, 487 visitors in 2006 and 913 visitors in 2011). Survey days were stratified across morning, afternoon and evening timeframes during week and weekend days from June through September each year. Just over eighty percent of the interviews were conducted at sites within the ODNRA near Reedsport, Oregon, with the remainder completed at the Sand Lake area, on the northern Oregon coast. The focus of this investigation was an evaluation of visitor perceptions of conditions at the Oregon Dunes National Recreation Area and Sand Lake area during the summer 2002, 2006 and 2011 recreation seasons. Results of the initial 2002 survey suggested that visitors generally:

- encountered about the same number of visitors as they expected,
- did not experience much conflict or interference from other visitors,
- perceived the area and its surroundings to be in good condition,
- had a good time during their visit, and
- did not feel that there were too many people or OHVs on the beach.

Responses to many of the questions changed dramatically between 2002 and 2006. However, the 2011 data had greater similarities to the original data collected in 2002. There were differences in both the characteristics of the visitors and their perceptions during the 2006 study. For example, in 2006 there were less first time visitors than in both the 2002 and 2011 studies. Also, the visitors in 2006 stayed at the ODNRA for a longer period of time whereas the 2002 and 2011 visitors stayed nearly the same length of time. Yet, the 2011 visitors travelled the farthest to recreate at the Oregon Dunes area than visitors from the other studies. In 2006, a greater amount of visitors travelled to the areas at the ONDRA from states outside of Oregon.

A series of questions dealing with acceptable numbers of beach users and OHVs showed that most visitors in 2002 found the social conditions that they encountered acceptable. There were differences between the riding areas, however. Visitors at Sand Lake reported higher encounter and crowding levels than those at sites within the main Oregon Dunes NRA. In 2006, the differences between Oregon Dunes and Sand Lake were still evident, but the visitors were much less tolerant of other OHVs and reported seeing smaller numbers of other riders while recreating. In 2011, visitors reported seeing an even smaller amount of other riders on the Dunes. Yet these visitors indicated that they would be comfortable seeing an overall higher number of other riders while recreating at the ODNRA than the 2002 and 2006 visitors. Visitors in 2006 showed greater awareness than 2002 visitors of what to expect in terms of crowding. Conversely, a larger percentage of visitors in 2011 reported seeing less crowding than they expected.

Survey results between the three years indicate that Oregon Dunes visitors express increasing levels of satisfaction with their visits and would like to see management continue in the directions that are currently being pursued. Visitor perceptions of acceptable crowding levels have changed throughout the studies as well. Despite the fact that overall use has increased at the ODNRA, the data shows growing visitor tolerance to crowding.

Discussion during the presentation will focus on understanding the role of crowding and conflict in predicting overall satisfaction. We will test the hypothesis that a floating base of satisfaction is the result of management actions over the past decade, including a ban on alcohol and increased ranger patrols. In addition differences in the visitor characteristics and trip characteristics will be examined to understand how the respondents have changed over the three waves of data collection.

Plitvička jezera National Park - outdoor recreation possibilities and conflicts

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Plitvička jezera National park is one of the oldest and the most visited protected areas in Croatia. This unique protected place celebrates in 2014, 65th anniversary of National park establishment (established on 8th of April 1949) and 35th years of entry to the UNESCO

World Heritage List as a Nature protected area (registered on 26th of October 1979).Within the framework of the Ecological Network Plitvička jezera National Park has been designated international importance and from September 2013 it is the area of Natura 2000 Ecological Network.

The Plitvice Lakesare has specific geological and hydrological karst phenomena consisting of lakes and waterfalls created by the biodynamic process of tufa development and remarkable biodiversity of flora, fauna and fungi. The park is situated in the mountain region of Croatia relatively close to the Adriatic coast and most developed areas of tourism.

Outdoor recreation in Plitvička jezera National park

The term of outdoor recreation is not used in the existing literature about the Plitvička jezera National park, there are only fragmentary articles more connected to the marketing of tourism industry than to the scientific research. This article attempts to make a short resume of exiting outdoor recreation possibilities developed by national park authorities, potential possibilities and outdoor recreation in the Park's surrounding municipalities and conflicts in outdoor recreation.The outdoor recreation in Plitvička jezera NP is closely tied with tourism but it's organization is incorporated into different organizational structures of Plitvička jezera NP. Possible activities in the Park include trekking and sightseeing as most represented and most acceptable for the national park as a protected area. Some outdoor activities inside the Park like swimming, snorkeling, canoeing, rock climbing, canyoning are not allowed due to its fragile nature and wildlife. Others like rowing, horseback riding and bicycling are allowed just in some zones according to zonation in Management Plan.

There are 7 different visitor programs mostly including trekking around lakes, electro boat and panoramic vehicle ride and they are tied to the Park's lake zone. Other two programs are found in forest ecosystems of the Park.

The camping facilities of the Park include two campsites: Borje on eastern park border and Korana on north west park border.

Educational and recreational trails of forest ecosystems - New trekking possibilities in Plitvička jezera National Park

With more than one million visitors every year Plitvička jezera National Park is one of the most visited places in Croatia and the most visited of eight national parks in this country.

There are around 70 km of marked trails in Plitvička jezera NP. Beside 24 km of trails in visitor system where visitors can use an electric boat and ride a panoramic vehicle, there are 14, 6 km of educational and recreational trails of forest ecosystem in hiking trail "Medveđak" and 30 km of educational and recreational trails of forest ecosystems inside the "Čorkova uvala" trail (21 km) and "Plitvica" trail (9km).

Special events of outdoor recreation in Plitvička jezera National Park

One of special events of outdoor recreation which is very popular among park's visitors is a traditional Plitvice Marathon race organized during the first Sunday in July every year. During the last 29 years it has been one of the most visited events during the tourism season. Occasionally there are some orienteering competitions like in 2006 and 2007 as the Park area is very attractive for this kind of nature friendly outdoor activity which.

Possibilities of outdoor recreation out of borders of Plitvička jezera National Park in the municipalities around the Park

Beside the outdoor recreation inside Plitvička jezera National Park borders there are possibilities for outdoor recreation in the surrounding municipalities. The Plitvička jezera NP is circled by four municipalities: Plitvička Jezera, Vrhovine, Rakovica and Saborsko situated in two counties. Every municipality has different options for outdoor recreation facilities like trekking, mountain biking, adventure parks, sport fishing, kayaking etc. which are more or less developed according to the data of local tourism boards.

Hikers and mountain bikers – do they fight like cats and dogs?

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Introduction

Hiking and mountain biking are very popular recreational sports activities in many parts of the world, including Switzerland (Lamprecht *et al.*, 2008). Furthermore, the number of people participating in outdoor recreational activities has increased in the last years (Cordell, 2008, Lamprecht *et al.*, 2008). In Switzerland, the level of marketing activities and investment in trail networks in holiday destinations in the Alps as well as predictions from tourism experts suggest there will be a further increase in these sports activities.

Articles in newspapers and online blogs show, there is an on-going public debate on the subject of the compatibility of hiking and mountain biking. Furthermore, several scientists have described conflicts between these groups in urban areas and their surroundings (von Janowsky and Becker, 2002, Reichhart and Arnberger, 2010, Wyttenbach, 2012).

The sustainable management of recreational and protected areas requires detailed knowledge of what hikers and mountain bikers want from their destinations and of their behaviour. Only with such knowledge will managers be able to create a suitable infrastructure for their visitors that will reduce conflicts between the two groups and develop long-lasting, positive experiences.

"They fight like cats and dogs" – means that hikers and mountain bikers quarrel all the time, they don't understand each other at all, speak different languages, etc. Therefore several questions have to be answered:

(i) Who are "the hikers" and "the mountain bikers"? (ii) How do they perceive each other? (iii) Do hikers and mountain bikers share common areas and infrastructure?

Methodology

Based on the assumption that hikers and cross-country mountain bikers don't differ that much, an almost identical internet survey of the two groups was carried out in 2010 in Switzerland. Links to the survey were placed on several well-frequented outdoor sports websites e.g. Swiss alpine club, sports gear retailers, etc. People who had participated in former studies and agreed to be on a panel for further outdoor surveys were also contacted by mail. A total of 317 mountain bikers and 948 hikers correctly answered the German questionnaire.

The first section checked whether the respondents qualified for the sample. In the second section the sample was split according to their preferred outdoor sports activity – hiking and mountain biking – followed by specific questions about the chosen activity. In section three, the respondents were then split according to their preferred tour duration (threshold 4 hours), resulting in four groups. In section four, information about their planning habits and tour preferences (including a discrete choice experiment) was examined and in section five trail preferences (incl. a trail-choice experiment) and questions about socio-demographics completed the questionnaire.

Selected results

The distribution of hikers' age categories was similar to that of the German-speaking population in Switzerland, the mountain bikers were slightly younger and their distribution did not differ significantly from a representative Swiss sports study with over 10,000 respondents (Lamprecht *et al.*, 2008). Mountain bikers tended to take shorter lasting tours, on the other hand the bikers rode their bike more often than the hikers went walking (T-test, p=0.000). In general "landscape appreciation", "experiencing nature" and "being active" were the three most important motivations for bikers and hikers. Further significant differences could be observed between the two groups e.g. in "fun", which was more crucial for bikers (see figure 1).

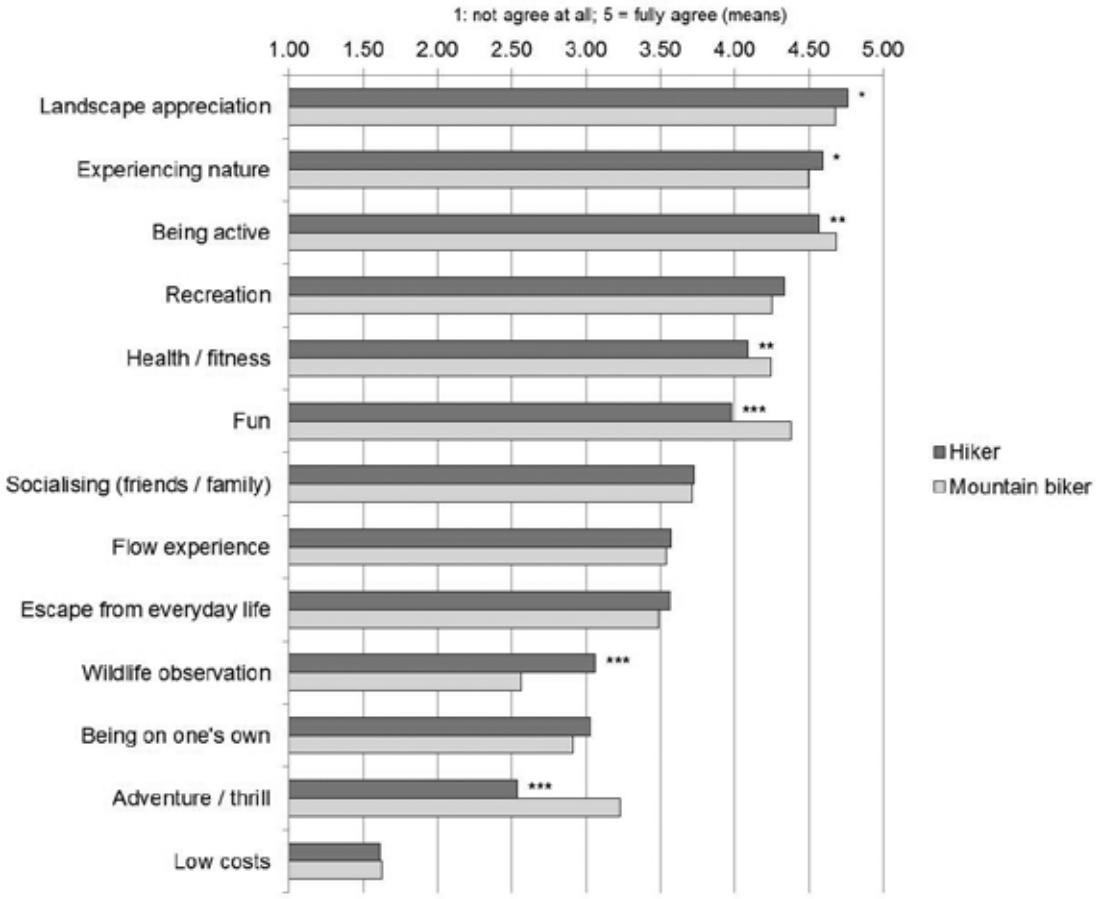

Figure 3: Hiker's and mountain biker's motivations: 948 hikers, 317 bikers; T-test: significant differences: *** p<0.001; ** p<0.01; * p<0.05 (for factors see: Zeidenitz et al., 2007)

Hikers planned their tours in more detail than mountain bikers and most of the respondents stated that they planned their tours at home. However, bikers were more likely to make spontaneous decisions (T-test, p<0.01). They also differed in their preferred information media – hikers used more traditional media, such as printed maps and tour guides (T-test, p<0.001), whereas mountain bikers asked friends (T-test, p<0.001), accessed tour web sites (T-test, p<0.05) and used digital maps (T-test, p<0.01).

Hikers stated that they leave a trail to make a shortcut to watch wildlife and pick flours (T-test, p<0.001), while bikers avoid trails with too many people (crowding, T-test, p<0.001).

In the tour-choice experiment, the hikers and the mountain bikers could each be separated into four different classes, which provided a more detailed insight. Hardly any differences between the hikers and bikers could be detected in the altitudinal belt where alpine meadows were the most preferred landscapes. All hiker classes sought spectacular views, whereas the view was not that important for mountain bikers. The hikers and mountain bikers showed more tolerance when encountering other people doing the same sports activity than people doing the other one. The latter was verified by the trail-choice experiment where encountering one group per hour was accepted, but more encounters were rejected. Mountain bikers tended to act more independently than hikers – they rated "trail guiding with signs" lower or thought they would find their own way through a landslide section, which tallied with previous findings.

Conclusions and management implications

Managers of destinations and protected areas not only have to solve and reduce conflicts between mountain bikers and hikers – but also need to provide valuable experiences for their guests and visitors.

This study provides detailed information about the behaviour of bikers and hikers in mountain areas in the German-speaking part of Switzerland, independent of any region.

Nevertheless, the first step for regional managers must be to identify who their guests are. Visitors' satisfaction with the existing biking and hiking tours and the associated infrastructure need to be assessed, since the trail network may have

to be adapted to these preferences. In order to have a positive effect on visitor experiences, managers need to create a sufficient number of alternative tours with as few shared trails as possible. The next important step must involve adequate communication of the hiking and biking tours that are available. Websites are important publication channels and provide mountain bikers and hikers with much needed information at home or on mobile devices for choosing and planning their tours in advance. With the involvement of residents in this process, an important step in a region's sustainable development can be made.

Referring to the title – hikers and cross-country mountain bikers are not as different as many people and managers of destinations and protected areas believe. Most of their motivations and requirements and much of their behaviour are similar (see figure 1). Conflicts are often caused by differing downhill speeds or by the intrusion of a new species of outdoor recreational user in territory that has been traditionally used exclusively by hikers.

Acknowledgements

We would like to thank all the project partners for their collaboration and financial support: Canton Grison, Biosfera Val Müstair, Swiss National Park, Rapp Trans AG, Impuls AG and Art of Technology.

The project was principally funded through the Swiss commission for technology and innovation CTI.

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SESSION 6C ECONOMIC VALUATION OF RECREATION AND TOURISM

The importance of tourism for the regional costs and benefits of national parks – the case of Bavarian Forest National Park, Germany

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Introduction

For a number of years, national parks in Germany have been recognized as major attractions for nature-based tourism which generates considerable income and employment possibilities for the mostly peripheral and structurally weak communities surrounding protected areas (Mayer *et al*. 2010; Woltering 2012). However, the economic impact studies of national park tourism fall short of comparing the tourism benefits with the costs caused by national parks, being direct costs (i.e. in terms of state expenditures for park staff and investments), indirect costs (i.e. bark beetle damage in commercially managed forests adjacent to parks) or opportunity costs (i.e. the forgone income of timber sales and production impeded by the protected area) (Dixon/Sherman 1990). Additionally, as tourism constitutes only one of several benefits of national parks, the importance of tourism compared to other benefit categories (i.e. impact of park expenditures, ecosystem services, non-use values etc.) is widely unknown. Furthermore, the economic impact of tourism derived from the park visitors' expenditure is not the only tourism-/recreation related benefit category of protected areas. The recreational value that is the consumer surplus of park visitors being not charged any entrance fees for recreation in German national parks has so far been largely overlooked in Germany. Nevertheless, visitors are definitely attributing value to this public good which is proven for instance by the costs borne in travelling to national parks and the opportunity costs of time (forgone income because of not working while abroad) (Mayer 2013, 2014).

In order to overcome the shortcomings of existing research a comprehensive cost-benefit-analysis of a national park focusing on the regional level of its neighboring counties is presented in this study. It seeks to answer the following research questions:

1) Which costs and benefits of national parks occur on a regional scale?
2) Which share of park benefits can be attributed to tourism?
3) Which share of park costs can be covered by tourism benefits?

The survey area of the presented study is the oldest and most well-known German national park, the Bavarian Forest National Park, established in 1970 in a densely wooded mid-mountain range and its two surrounding counties, Freyung-Grafenau and Regen.

Methods

Cost-benefit-analysis (CBA) as a standard tool in environmental valuation compares the discounted costs and benefits of a project in a given timeframe and measures its net present value (NPV) which should be higher than zero in order to achieve an economic justification. The input data of the CBA are derived from a wide range of valuation approaches including an economic impact analysis of tourism, a travel-cost model, contingent valuation, a budget analysis of the park, modelling of opportunity and indirect costs etc. The valuation tasks are again based on several empirical surveys, for example a large-scale visitor survey (>10,000 short and ~2000 long interviews), an enterprise survey in the counties surrounding the park, qualitative interviews with foresters, forest owner associations and sawmill operators (>40 interviews), as well as an extensive literature review and secondary data research. The alternative scenario required by a CBA is based on the very likely assumption that the area would be a regularly managed state forest in case that the national park would not exist. The methodology is explained in full detail in Job/Mayer 2012 and in Mayer 2013, 2014.

Results and discussion

Table 1 shows that the regional benefits of the Bavarian Forest National Park surpass its costs in both the maximum and the minimum scenario with benefit-cost-ratios >1. The direct costs are mostly paid by the Bavarian State Government and not by regional institutions. These state expenditures for staff wages, park management and investments provide an enormous benefit for the park region, as the majority of the staff (in total ~190 full-time employees) lives nearby and thus

spends their income mostly in the park surroundings. The opportunity costs of forestry and timber industry are smaller than on the national economic perspective, because only staff wages and the (limited) investments of the state forest remain in the survey area as the profits are transferred to the state budget. In contrast, the economic impact of tourism remains in the region to a much higher extent. However, its size varies with differing assumptions of the role of the national park for the trip motivation. The consumer surplus of park visitation is rather limited on the regional scale, as only the consumer surplus of local visitors is considered here – the consumer surplus of overnight visitors occurs per definition in the source areas of these visitors. In general, the national park is economically justified from the regional economic perspective. The region profits from the park's existence and receives net gains in income and employment through state expenses and tourism.

Table 1: Regional cost-benefit-analysis scenario 2007

Costs (million EUR)				Benefits (million EUR)		
		REG MAX	REG MIN		REG MAX	REG MIN
Direct costs		2.364	2.364			
Indirect costs		0.363	0.041			
Opportunity costs	Economic impact of state forest expenditures	0	0	Economic impact of park expenditures	9.253	9.253
	Productive use (forestry and timber industry)	6.810	5.450	Productive use (forestry and timber industry)	1.822	1.492
	Economic impact of tourism	5.120	2.870	Economic impact of tourism	13.150	1.369
	Recreational value (consumer surplus)	0.135	0.046	Recreational value (consumer surplus)	0.135	0.046
	Ecosystem services	4.564	0	Ecosystem services	4.564	0
	Non-use values	0	0	Non-use values	1.739	0
SUM		19.356	10.771	SUM	30.663	12.160
Benefits minus costs REG MAX				+11.307		
Benefit-cost-ratio REG MAX				1.584		
Benefits minus costs REG MIN				+1.389		
Benefit-cost-ratio REG MIN				1.129		

Source: adapted from Mayer 2013, p. 442

Tourism contributes between 11.7 and 43.3 % of the park benefits, which is lower than on the German national economic level due to the limited recreational value of the park on the regional level. However, without tourism benefits the park's regional NPV would most likely be negative. Tourism benefits also cover between 13.1 and 68.6 % of the park's cost on the regional level, which for the same reasons is again a lower share compared to the national level. The strong variability of these shares is due to the general question whether the economic impact of all park visitors should be taken into account (maximum scenario) or just the impact generated by those who would not have visited the region if the national park did not exist (minimum scenario).

All in all, tourism benefits constitute important parts of the benefits of Bavarian Forest National Park and contribute significantly to a positive economic valuation of the park on the regional level. However, the relative importance of tourism benefits is even higher on the national level where the consumer surplus of overnight visitors generates considerable societal benefits (Mayer 2014). Furthermore, on the national level the economic impacts of park expenditures are not taken into account because they show distributive effects. That means, the state could spend this money also for other purposes in other regions if the national park did not exist, which would also lead to a comparable economic impact.

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A new look at the costs of outdoor recreation

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An undervalued issue?

In the field of the economics of outdoor recreation, special efforts have traditionally been made with regard to the evaluation of non-market benefits (i.e. the study of the "demand" side). Although this has unquestionably produced many very interesting results, from our point of view it has also led to the underestimation of another important aspect of economics i.e. the costs of outdoor recreation. Several publications have pointed out the multiple aspects of recreational costs (Loomis & Walsh 1997), including acquisition costs, operational costs, transaction costs, opportunity costs, congestion costs or even damage costs. For the reason outlined above, the costs that are neglected in market values (mostly congestion and damage costs) appear to have caught the attention of economists (Hanley *et al*. 2003). By comparison, other components of costs (acquisition, operational, transaction) have not received the attention they deserve and that they still lack sound economic analysis. Various reasons may be given: the data should be available a priori (in financial documents or contracts) or the subject should be relevant to engineering and not economics (because it refers to the installation of facilities which are generally designed and managed by technicians rather than social scientists). As a consequence, cost estimates frequently rely on ad hoc values (e.g. included in a local cost-benefit analysis) and little is known about their variability. In a world of scarce resources, costs definitely do matter. By comparison, significant efforts have recently been made in sectors such as environmental conservation (see the survey of Naidoo *et al*. 2006, for instance). Where do we stand today with outdoor recreation?

The neoclassical "production costs" framework

Most of the approaches that drive the analysis of recreational costs are based on traditional neoclassical micro-economic theory. This theory offers analytical tools to study the multiple dimensions of the recreational supply, such as factor productivity, scale economies, seasonal variations or multi-functionality (Loomis & Walsh 1997, Bowes & Krutilla 1989). According to Loomis and Walsh, various empirical strategies stem from this framework. Econometric approaches are one of them, though they are seldom used, despite their strong explanatory power and the multiple toolkits they offer. In this presentation, such a method is illustrated by the study of recreational costs evaluated on a sample of 8 recreational sites located in public forests (with an 11-year period). Several cost drivers are identified (areas, level of use, configuration of the sites, cycling paths) and estimations of the marginal costs of visits are given (between €0.01 and €0.07). Estimates significantly increase when the site's capacity is saturated. However, marginal costs remained below average operating costs, estimated at €0.24 per visit, which raises problems for the financing of management. Other less complicated methods based on simulated costs are also examined. One of these is applied in the study of peak-load pricing at a very popular recreational beach located in south-western France (that roughly received 600,000 visits a year). In this other case, the seasonal average cost values vary between €0.33 and €1.03 per visit. Visitors who actually use the site during peak periods should then take charge of the costs of extending the site's capacity.

Opening the "black box"

Although such indicators may be very useful for managers, the underlying theory suffers from two major limits, i.e. the supposed efficiency of the internal organization and the particular nature of the economic output (as usually measured by the number of visits). Whether access is provided by one or several stakeholders, efficiency is far from being guaranteed. On the ground, various forms of organization are observed, which are rarely based on efficient economic relations and inevitably impact the overall management costs. The latter point is illustrated with another original study on the evaluation of a local French public beach management policy. This work describes how moral hazards, subsidies, managers' motives and financial resources impact the cost structure. Such institutional "arrangements" remain key features of recreational supply. Turning to the definition of recreational output, it is important to recognize that, in many cases, the managers offer a "recreational opportunity" rather than a "final product". The level of the use that potentially impacts costs is therefore partly defined by visitors' preferences. This point may raise significant endogenous problems and invites us to look at a different analytical framework. In this respect, the work of Gadrey (2000) offers stimulating perspectives. Aimed at a better characterization of the economic nature of services, Gadrey's framework insists more on the social nature of the relationships that underpins the service, than on its technical properties (as defined in the traditional production function approach). Most of all, it addresses the situation of the "co-production" of services, both by consumers and by suppliers. Nevertheless, adaptations to the special case of recreation, with its implications on costs analysis, seem necessary.

Perspectives for future research

To conclude, three stimulating perspectives for future research are discussed: i) how to improve our knowledge on current recreational costs *via* a broader review of the international literature or some sort of meta-analysis; ii) how to devise a

sound economic theoretical framework adapted to the recreational supply; and iii) how to introduce new variables for the monitoring of the recreational service.

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Tourists' willingness to pay for entry fee in Langtang National Park, Nepal

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Introduction

Protected areas (PAs) are established as an instrument to conserve biodiversity and maintain ecological processes (Dudley, 2008). Besides nature conservation's role, protected areas are also the destination of nature based tourism and recreation. However, establishing and managing protected areas is a costly business requiring money to achieve balance between conservation and recreation or park tourism. Lack of finance can undermine the conservation objectives of protected areas. Currently, Nepal has 10 National parks, 3 wildlife reserves, 1 hunting reserve and 6 conservation areas covering 23.35% of its territory, including buffer zones (DNPWC, 2012). Of these PAs, Sagarmatha (Mount Everest) National Park and Chitwan National Park are world heritage sites (natural) and 6 Ramsar Sites are within the protected area system.

In most of the developing world, a protected area charges an entry fee to generate a fund to meet its management cost and Nepal is no exception to this. Every protected area in Nepal charges a tourist entry fee based on a three-tier fee system: foreign tourists, SAARC tourists and Nepalese. However, in the Himalayan and Mountain parks and protected areas such as Langtang National Park (LNP), Nepalese are allowed to enter free whereas in other parks they have to pay, but very much less in comparison with foreign tourists. The entry fee is also varied among different protected areas. In Langtang National Park, foreign tourists are required to pay NRs. 3000 (about US$ 30) as a park entry fee per entry/visit and the fee was revised about two years ago, from NRs. 1000. In the fiscal year of 2011/2012, the number of foreign visitors was 14,134 in Langtang.

Methods

Contingent Valuation (CV) method was employed in order to explore the Willingness to Pay (WTP) of foreign visitors for entry to Langtang National Park, Nepal. A payment card method was used to elicit the WTP of visitors, which ranged from Zero to US$ 300 (and more). CV question was followed by the question that asked reasons for visitors' willingness to pay (or not willing to pay) for an entry fee. Face-to-face interviews (N= 187) were conducted in Langtang in the autumn of 2013. Only foreign tourists were surveyed because they were the ones to pay the highest entry fee of NRs. 3,000. LNP is the first Himalayan national park in Nepal established in 1976 and covers 1710 sq km.

Result and Discussion

60% of the respondents were male and 40% female with average age of 40.81 years ((± 14.20). The age range was from 19 to 66 years. Majority of the visitors came from France followed by Germany and the United States. The primary motive for visiting Langtang National Park was trekking/hiking. Tourists in LNP spend about 9.73 days in average. The minimum visitor days was found to be 4 days and maximum days was 25.

Out of 187 respondents, only 145 expressed their WTP in monetary value, which was 77.5% of response rate. The majority of the respondents (70%) were willing to pay more than the current entry fee of US$ 30. Only 8% of the respondents replied that they did not want to pay any amount of the entry fee and it was 17% of the respondents who were willing to pay less than the current entry fee. Mean WTP was found to be US$ 63.59 (± 55.44) and median WTP was US$ 50. This finding is similar to the previous studies in Nepal's Annapurna Conservation Area and Chitwan National Park where the visitors were willing to pay more than the existing entry fee (Baral *et al.*, 2008; Cook, 2011; Wrobel and Kozlowski, 2011). However, visitors stated certain reasons for their willingness to pay for the hypothetical increase in the entry fee. Distribution of WTP bid amount is provided in the figure below.

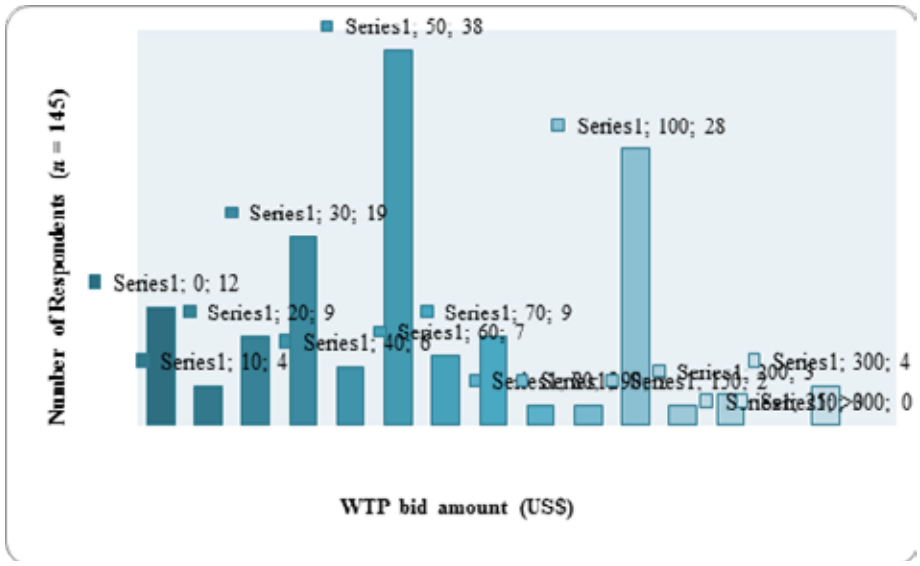

Figure: WTP bid amount in Langtang National Park, Nepal (N = 145)

In the fiscal year of 2011/2012, LNP generated US$ 351,930 from foreign tourists only in the form of the park entry fees. 66% of the respondents are willing to pay US$ 50 or more. Given the hypothesized entry fee and the prospective number of visitors willing to pay for this sum of money in LNP, US$ 50 could have generated US$ 466,400 which is the maximum revenue for the park that can be generated than any other entry fee.

Conclusion

Although the fee was increased to tap the economic potential of the park's tourism in LNP, it is found that tourism value still holds more to the visitors. Nepal government has recently increased the fee, therefore it would be wise to increase the fee after some year on trial basis. However, visitors' expectations have to be met before increasing the fee. Based on the demand curve and analysis of the revenue generated from the entry fee, it is reasonable to increase the fee to US$50. It is important to use the fund generated via the entry fee in protected area management and local community development rather than to deposit to the central treasury.

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Securing quality of landscapes through market-based mechanism between forestry and tourism in Finland

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In the Nordic Countries, the traditional public right of access allows access to all undeveloped areas for recreation and traditional use of nature regardless of the ownership. In northern Finland, for example Levi and Ruka, tourism resorts are surrounded by private lands and therefore, tourism is dependent on the recreational quality of the forests. As the aesthetic and recreational functions promote tourism and enhance economic development in rural areas, and therefore maintaining or enhancing landscape amenities is an important objective in forest management in tourism areas (e.g. Ahtikoski *et al*. 2011). Although management practices have been improved to take landscape and recreation values into account, concerns around landscape deterioration are repeatedly raised into public debate. Market-based mechanisms have been suggested as a new approach to balance the provision of private and public forest benefits.

This paper presents the main idea of a landscape in scenic value trade suggested to be implemented in private forests with high tourism and recreational use pressures in Finland. Moreover, key results of two studies conducted in the Ruka-Kuusamo tourism area in northeastern Finland assessing the possibilities of starting a trade dealing with landscape and recreation values between forestry and tourism sectors will be presented.

What is landscape and recreation value trade?

In Finland suggestions for models for landscape and recreation values trading (LRVT) in private lands have been launched by forestry and landowner organizations some years ago. Recently, a procedure involving a large number of landowners and tourism entrepreneurs in tourism areas has been suggested (Tyrväinen *et al* 2013). Financing would be collected from the beneficiaries (i.e., users of landscape and recreational values) in connection to the prices of tourism services such as accommodation (Figure 1). Forest owners would be rewarded with payments for undertaking the specified measures that could include a range of forest management options.

An LRVT contract would define areas important for recreation and tourism within private forests, typically along outdoor recreation routes, roads, resting places and shores, in which the scenic and recreational quality would be secured. The emphasis would be on mitigating the landscape effects of final fellings by delaying the felling or using for example selective harvesting. Crucial to a feasible mechanism is a cost-effective solution for collecting the funds from the tourists and/or tourism enterprises.

Preconditions for trading landscape and recreation values in Kuusamo tourism area

The demand study (Choice experiment survey) focused on domestic as well as foreign tourists' demand for and willingness to pay (WTP) for enhanced forest amenities, in particular landscape values and biodiversity, in private forests. The data for the tourists survey were collected during winter-spring and summer-fall season, resulting in a data set with over 900 observations. Foreign tourists' represented 25% share in the data. Ruka is the largest ski resorts in Finland. Annually around one million tourists visit Kuusamo area.

The results support the idea that tourists are willing to pay for selected improvements in the quality of outdoor recreation environments through adjustments in forest management. Both foreign and domestic tourists were willing to pay for improvements in the forest landscape, in terms of less frequent clear-cutting and site preparation areas along the routes, as well as for increased biodiversity. Foreign tourists' willingness to pay was significantly higher than domestic tourists'. Neither group would pay for extended outdoor recreation routes or increased carbon sequestration.

The supply study investigated forest owners' willingness to participate and their compensation claims related to the provision of enhanced forest amenities in the tourism area. The survey was targeted to reach all landowners that had property within or nearby Ruka-Kuusamo tourism area. Considering the novelty of the idea, relatively many forest owners were generally interested in the suggested scheme. The willingness to participate is strongly dependent on the payable compensation as well as other terms of the contract, such as duration and harvesting restrictions. Long contract durations and the stringent "no harvesting at all" restriction increased the compensation claims.

Conclusions

The studies conducted in Ruka-Kuusamo area suggest that the basic prerequisites for the proposed LRVT scheme seem to be fulfilled. The tourists showed a significant willingness to pay for enhanced forest amenities such as the landscape. One of

the most important improvements in the landscape for tourism would be mitigating the negative effects of final fellings and regeneration. In scenically sensitive areas small scale harvesting practises would be used instead. Moreover, regarding the design of the LRVT scheme, payments charged in connection with accommodation prices was the most widely accepted way of collecting funds to guarantee the payment of compensations to forest owners.

Moreover, relatively large share of forest owners were generally interested in participating in the suggested scheme. The details of the possible contracts, however, such as duration and harvesting restrictions have the effect on the acceptable amount of the compensation. The next step will be to conduct a pilot study in Ruka-Kuusamo area, to develop a more detailed mod with local stakeholders and pilot the model in the region.

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SESSION 6D USE OF ICT FOR RECREATIONAL ACTIVITIES

Alternative ways for attracting teenagers to protected areas: intergenerational learning and location based games

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Introduction

Nowadays it is evident how much youth are keen and incredibly familiar to Information and Communication Technologies (ICT) which are used for different purposes like social networks, school researches, playing games, and how mobile technology is the most affordable and multitasking and of ordinary use in all generations. Therefore, smartphones and tablets can be the tools for combining two generations and make them working together.

Intergenerational learning, which describes the way that people of all ages can learn together and from each other (www.enilnet.eu), fosters reciprocal learning relationships between different generations and helps to develop social capital and social cohesion in our ageing societies (Rogers and Taylor, 1997)

Therefore, the combination of pupils skills on ICT with elders' knowledge proves a mutual knowledge transfer between generations by which, on one hand younger generations can benefit from elders' mentoring (Morrow & Styles, 1995), on the other hand, mentoring experiences allow opportunities for older adults to renew positive emotions and reinforce meaning in their lives (Larkin *et al*. 2005).

Moreover, in recent years, volunteering has been increasing, encouraged by the UN policy: 2011 was declared the 2nd European year of Volunteering and the EU shows strong interest especially for its contribution to social cohesion, building European identity and values.

Key motives for participating in the nature conservation volunteering generally are firstly 'helping the environment', then 'improving areas that volunteers use for their own recreation', 'expressing their values', 'learning about the natural environment' and 'socializing with people with similar interests' (Brett Bruyere and Silas Rappe, 2007) and 'learning and contact with nature' (Liarakou *et al*. 2011).

The technological and eco-psycological considerations are the pillars of Involen project (Intergenerational Learning for Nature Conservation Volunteers), a European project funded by Lifelong Learning Programme (GRUNDVIG Multilateral Projects).

Location Based Games (LBG) for mobile devices are applications by which players have to solve quests to move from place to place and complete the game. LBG can be also played in a protected area unless the internet coverage is weak. The combination of intergenerational learning, nature conservation and LGB can reach smartly several purposes: i. raising the awareness for active ageing, posing the challenge to politicians and stakeholders to improve opportunities for active ageing in general and for living independently, acting in areas as diverse as adult learning, volunteering, IT service (Bird, 2007), ii. raising the interest of pupils toward nature and environmental volunteering, iii. the valorisation of the area giving visitors new tools to discover it and enhancing the educational offer of natural parks delivering the innovative training course on LBG and intergenerational learning to schools, adults, nature volunteers, environmental guides etc. in order to finally encourage iv. nature conservation volunteering.

Involen model

Involen targets youth and elders in 5 European countries (Italy, Greece, France, Hungary and Slovenia) with motivation and passion for nature.

In Italy, Involen has been piloted for one year (April 2013 - May 2014) in Livorno town, a big town very close to the Provincial Park of Monti Livornesi. This natural park is about 3000 hectares wide and thanks to a group of local associations (Occhi sulle Colline) is undergoing a participatory valorisation process.

A small and heterogeneous group made by 8 students of the secondary school I.C. Micali, 4 facilitators (WWF staff and teachers), 5 elders and 2 ICT experts, collaborated during about 20 meetings achieving in the end a variety of competences. The learning path was made by six work units, described in table 1, piloted by facilitators and finally evaluated.

	Unit purpose	Methodology
1	Individuation of competence needs about intergenerational learning, issues concerning the protected area and ICT. Plan of the learning path schedule	Questionnaires, meetings for set up the calendar
2	Presentation of an example of LBG by ICT expert	Presentation
3	Collection of stories, legends, tales by elders about the protected area	Interviews
4	Selection of stories and information for the story and its storyboard	Group work
5	Visit to the protected area for volunteering activities and collection of information for the LBG	Field visit and practical activities
6	Development of the LBG (using ARIS)	Group work

Work units in INVOLEN learning path.

The game was developed on ARIS platform (http://arisgames.org/get-aris/), a location based game application which allows players to solve quests, get items, have dialogs with characters, etc. in order to move from place to place.

ARIS is open source and has a good FAQ service, useful for users. Moreover, all ARIS games are freely accessible from ARIS App store though they can be played only on Apple devices (iPhones and iPad).

After the collection of stories and information on Monti Livornesi told by seniors, the pilot group invented a story in which, the most famous and representative characters of the area interact with the player and they also created the storyboard: the scenario and the flow of actions. The storyboard was then transformed into LBG through the use of ARIS platform.

Involen methodology was successful for learners: new competences, information on natural and historical aspects of the area, behaviour attitudes were learnt from each other, either seniors and teenagers. Seniors transmitted their knowledge and passion for the environment, photograph, flowers, rare species and conveyed proper attitudes in the nature, but they also learnt how to interact and communicate to pupils and how to do a mobile game.

At the same time, new friendships and a closer intergenerational link was created inside the group. Since seniors and facilitators are members of nature volunteering associations, we expect a successful imprinting on teenagers. If Guiney *et al.* (2011) demonstrated that nature volunteers feel a connection to nature and this connection began in childhood, we have good feeling that this methodology might seed in pupils a strong interest for nature protection.

To conclude, practical outcomes of Involen model consist in i. a reliable methodology for environmental organisations (parks, ONGs etc.) which want to encourage nature conservation volunteering and increase their educational offer to youngsters and elders, and ii. the LBG that can be considered an added value for recreational or protected areas with large potentialities in attracting young visitors (but maybe also adults) with amusing and informative tools and for their capacity to guide and distribute visitors in specific trails where the game has to be played.

Acknowledgements

The project is funded by EU. LLP, GRUNDTVIG Multilateral projects, PROJECT REFERENCE 527670-2012-GR-GMP. The project is ongoing and we thank the whole partnership (Hellenic Ornithological Society, GR; PRISMA, GR; La Ligue de l'enseignement, FR; Stichting PAN Parks European Management Organisation, HU; Notranjski ekološki center, SL) and youth and elders of the pilot group (Roberto Branchetti, Alfonso Corsini, Fabio Lazzeri, Iolanda Legitimo, Rossana Massari, Adelina, Adele, Matilde, Sara, Massimiliano, Giulia, Samuele).

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Geocaching and protected areas

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Introduction

Created in the USA after the discontinued use of "Selective Availability" within the Global Positioning System (GPS), geocaching can be explained as a modern treasure hunting that mixes handled GPS, tablets or smartphones, WEB2.0 wiki features and a community of over 6.000.000 geocachers worldwide. At the present time there are over 2.350.000 active caches, hidden within all environments from the hydrothermal vents to the highest mountains around the world. Taking advantage of internet features and web-GIS technology this activity is organized by an official website (www.geocaching.com), several national web-forums and discussion groups. Each cache is registered as well as each individual log or comment, being used to decide which cache should be done next time, or if there's a cache nearby that deserves a visit.

Previous work based on geographical analysis of this activity (Santos *et al* (2012) and Nogueira Mendes *et al* (2013)), have found positive correlations between "natural" land use environments (forest and agriculture) and geocaching activity in Portugal, and that in Lisbon this activity tends to happen with more intensity on touristic and iconic areas of the city.

These findings also suggest that protected or other recreational areas might be of special interest for geoacaching (mainly recognized as an open air activity), even if top expression of this activity (caches/area, founds/cache/week and total founds) happens within urban areas.

In order to fully understand this activity, it is important to know what makes a good cache. The place where it is hidden might be an important factor, but other aspects should be closely related with the number of visits that each cache gets. The caches description and the feedback provided after each found should also provide some clues regarding general perceptions and motivations related with this activity. Other aspects that deserve a special attention due to the massive expression of geoacaching in some countries, include insights if this activity can provide clues regarding the public perception of the territory. Is there a different expression between urban and non-urban geocaching? What are the negative or positive impacts of this activity? Is there a carrying capacity for geocaches and geocachers visits within recreational and protected areas? Are management measures needed to be taken, or geoacaching guidelines and the community self-control is enough to keep this activity compatible with other uses, especially within recreational and protected areas?

Therefore the main objective of this study was to understand and characterize geoacaching within protected areas in Portugal, proposing a quick method that could help to monitor this activity in similar areas in terms of his spatial and temporal patterns.

Study Area

The Arrábida Natural Park (PNArr), located within the Lisbon Metropolitan Area (that holds nearly 2.5 million inhabitants), is situated 40 Kms south from the Portuguese capital. Like many recreational and protected areas it faces growing pressure and demands for recreational activities. Lacking a formal and structured offer of paths, trails and visiting centres, visitation and recreational use is mainly informal leading to some conflicts and impacts.

Material and Methods

A first dataset for this study was collected from www.geopt.org (one of the Portuguese geocaching forums) in October 2012 that includes all existent geocaches ever placed in Portugal since 2001 (24402 geocaches of which 5451 were archived – i.e. not available to be found and logged at that time). Caches exact location was updated and corrected from the geocaching official webpage and converted into a shape-file on ArcGis that was also used to select all caches within PNArr (278, of which 55 were archived) that all together where responsible for 29448 logs of which 26086 were founds, i.e. expressed visits to this protected area). A second dataset was created from each geocache webpage that was saved in an .html file for a latter content analysis regarding to each geocache description performed by a small questionnaire built in order to understand the overall image that this activity provides regarding the PNArr heritage and conservation values. Does the cache webpage refer that this is within PNArr? Does it mention that this is a protected area? Does it mention or is it dedicated to any of the natural or patrimonial values that the PNArr should preserve? Results were later used to perform spatial autocorrelation tests using Anselin-Moran's global index on ArcGis.

The third and final dataset was built from each log (including founds, not founds and comments) ever made to each

PNArr geocache that include the log date and user that made it. This dataset was used to perform a temporal analysis to this activity.

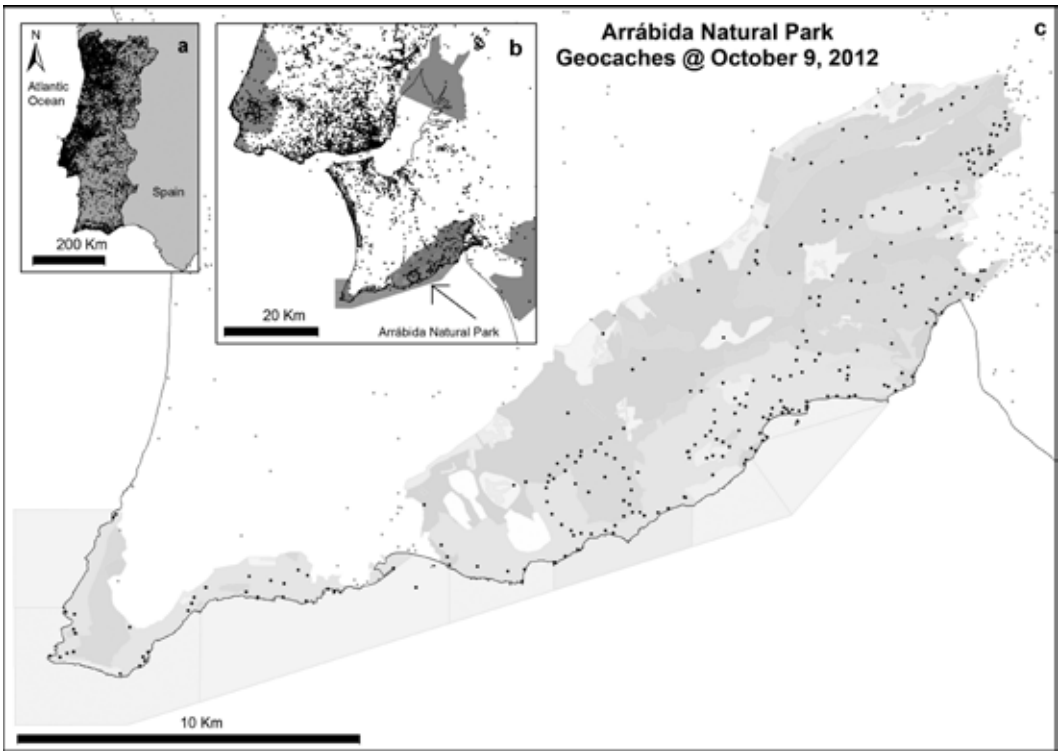

Figure 1 Geocaches of Portugal Mainland (a), Lisbon Metropolitan Area (b) and Arrábida Natural Park (c), from the original dataset collected at October 9, 2012.

Results and Analysis

From the total 278 analysed geocaches, 65 mentioned PNArr and 6 also include the zoning plan of the place where they were hidden. 219 of the geocaches directly expressed some value associated to this protected area (remarkable architecture – 96; cultural heritage – 119; local history – 62; fauna – 51; flora – 80; geology – 75; landscape – 111). 58 of the webpage descriptions included other language besides Portuguese, 211 included pictures of the area and 90 geocaches were promoted through small suggestions of local touristic activities. Finally, 35 geocaches webpages promoted positive behaviours (respect for private property and nature), but 4 directly promoted negative behaviours (trespassing, and invasion of totally protected zones, which is forbidden by the PNArr zoning plan). This also shows a major concern, which is the fact that 8 of the total analysed caches were inside the total protection area.

Anselin-Moran's global index tests have shown that there are spatial patterns regarding geocaches hidden places and the geocaches description, with main emphasis on the emblematic places of PNArr (best sightseeing spots close to the coast, national monuments, and best geological and botanical scenes).

Temporal analysis on all geocaches logs shows that this activity follows the normal pattern for recreational activities. Spring, summer and fall have by far more founds and logs than winter and weekends have up to 5 times more activity than working days (with significant p values measured by a Kruskal-Wallis ANOVA).

Conclusions

Final results of this study provide a new approach regarding geocaching activity within protected areas. Further evaluation should be done in other recreational and protected areas to confirm the main findings of this study, but important clues are presented and could be used in order to understand this activity. The overall picture of geocaching in PNArr resembles to the park itself, taking advantage of this protected area characteristics. Lacking interpretational centres, it is fair to say that geocaching provides visitor or resident geocachers with important information regarding Arrábida, mainly related to its geology, flora, landscape and typical uses. From the collection date up to 2014, the caches of Arrábida have almost doubled and the actual logs and founds have more than doubled in one and a half year which proves the viral grow of geocaching in Portugal. The findings of this study also allowed solving the 8 geocaches that were hidden inside total protection areas, that were voluntarily archived by the cache owners, which proves that geocachers are a conscientious community that can work together with the parks authorities for mutual benefits of all involved actors.

Acknowledgements

This paper presents research results of the Strategic Project of e-GEO (PEstOE/SADG/UIo161/2011) Research Centre for Geography and Regional Planning funded by the Portuguese State Budget through the Fundação para a Ciência e Tecnologia.

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Geocaching activity within protected *vs*. recreational urban areas

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Introduction

Geocaching is an outdoor game that uses Global Position System (GPS) enabled devices to find hidden containers, known as geocaches, in certain locations. After finding a cache, geocachers publish their accomplishment by logging in the official sites. Each log has the geocacher identification, the time the log was posted, and the comments to share with the owner and/or community regarding the finding.

Geocaching is an activity that is practiced by 6 million geocachers worldwide, with over 5 million logs submitted every month. Nevertheless, very few studies have been published regarding such phenomena.

Santos *et al*. (2012) studied the activity at a national level and found that while geocachers prefer places with significant natural heritage values, the majority of geocaches is placed in urban areas. Conclusions pointed for the need to study aspects like individual motivations, expectations and perceptions; social networking or physical aspects of places where caches are hidden (landscape, scenic views, cultural heritage, natural phenomena, and so on). Based on that, in a subsequent work conducted in Lisbon city, Portugal, Nogueira Mendes *et al*. (2013) attempted to characterize the social aspects of the game, looking into the geocachers' perceptions of the activity. We found that for monitoring the activity and the peoples' perceptions, different contexts (urban/natural) should be investigated. The present work aims to continue that analysis, by comparing geocaching patterns in a protected area and in an urban park.

Study Area and Data Set

Two study areas were selected for this study (Figure 1). In order to assess geocaching in an urban environment, Monsanto Forest Park, located in Lisbon city, the capital of Portugal, was selected. The park is the city's "green lung" that occupies an area of 900ha. It offers several recreational services like picnic areas, activity centres, sport zones, playgrounds, and maintenance circuit, among others. The space is used for a wide range of activities like mountain bike, running or skating. Arrábida Natural Park is a protected area located in the coastline, near Lisbon. The park is approximately ten times the Monsanto's area, occupying 10 000ha. The area includes typical Mediterranean flora and fauna, and the Marine Park. Hiking and mountain biking are common activities.

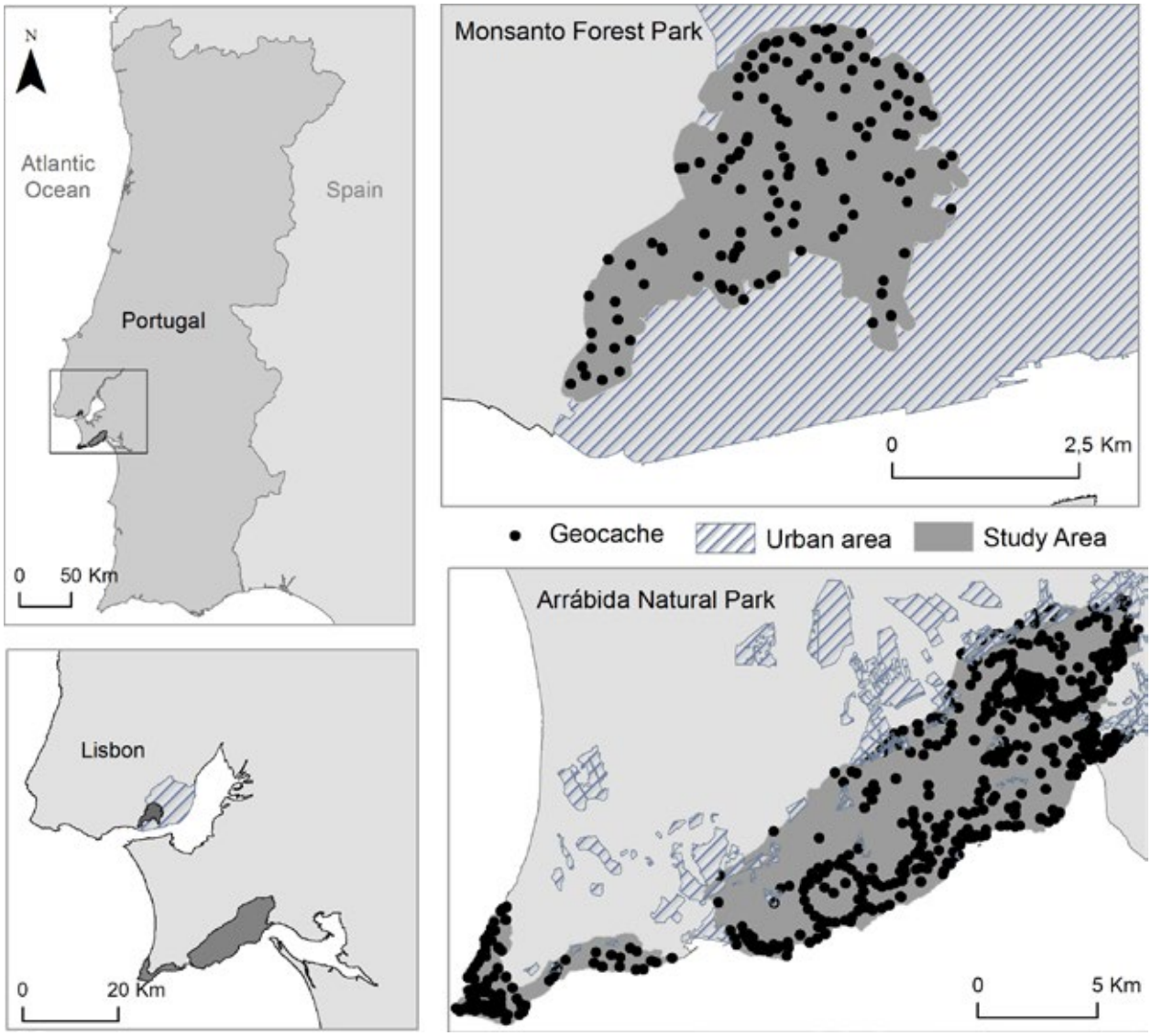

Figure 1. The two study areas selected for comparing Geocaching activity in urban and protected areas. Monsanto Forest Park is an urban recreational park while Arrábida Natural Park is a protected area.

The data set was collected from Geocaching.com. According to the respective analysis, two temporal data sets were analysed. To study the caches' activity and cache's perception, a data set comprising one year of information regarding all active caches, including location and log's activity, was used (from September, 1, 2011, till August, 31, 2012). For Monsanto Forest Park, 60 caches were evaluated, while for Arrábida, the set included 278 caches.

Regarding cache's popularity, all caches since 2006 until February 2, 2014, were considered (the event caches were disregarded). For Monsanto the set included 122 caches, while for Arrábida included 527 caches.

Methods

For proper comparison of results regarding two different contexts, the same methodology was applied in booth study areas. For each founded cache, the following characteristics were investigated: cache's popularity (visitation rate), caches' activity during one-year period, and cache's perception (logs' average extent). The goal is to assess the following issues:

- Do weekdays have a different behaviour than weekends and holydays, and if Spring/Summertime has also different activities than Autumn/Winter time?
- Is the average log length different in Arrábida and Monsanto?
- Is the visitation rate different in booth scenarios?

The visitation rate is calculated for each cache placed until February 2, 2014. Event caches were not considered since it only occurs in a specific time, and afterwards the cache is archived. The rate is based on the number of founds and not founds logged during the time the cache is active.

The temporal analysis is obtained by plotting each cache total of founds for each day during the period of analysis.

Geocachers' perception can be inferred from several attributes (cache's difficulty, terrain, etc.), but in this study we selected the log content. For each cache, all logs were examined. Based on average log length of each cache, a Top5 was created and for each cache, all logs were investigated (frequency and word cloud) concerning the words mostly used to describe the cache/site.

Results and Discussion

The temporal analysis allowed identifying the activity's seasonality. As expected, weekends and holidays have more activity than week-days. Furthermore, spring and summer are also preferred for practicing geocaching. Two days – August 8, and May 26 – revealed an activity completely different from the remaining 363 days. Booth days corresponded to geocaching events that gather local geocachers or geocaching organizations.

The visitation rate is comprehensively higher in the urban park than in the natural site. In PFM, each cache is visited 2 or 3 times, in a weekly basis, while in PNA, the rate is 1 to 2 times.

Regarding the log content, we found that the average text in Arrábida is almost 2 times the average of Monsanto (401 and 286, respectively). This fact indicates that natural sites are generally more appreciated by visitors, and deserve a more complete description of the whole experience. The Top 5 caches with the largest logs were subject to a text analysis to assess the most common words used. The word cloud produced an image with the most frequent words that, as expected, included the site's location and acknowledgments (e.g., TFTC - Thanks For The Cache).

Conclusions

Preliminary results from the comparison of urban and protected parks towards geocaching activity have shown that the activity is distinct. We found that whereas the visitation rate is higher in urban areas, in Arrábida Natural Park, geocachers share their experience in extended logs, while in Monsanto Forest Park, the logs are much smaller. Future work includes analysing the linguistic contents of each log, to identify perceptions of geocachers towards the territory. This work also demonstrates that geocaching can be a valuable source of information regarding open-air activities. Furthermore, due to the large data available regarding geocaching, the present methodology can be applied to other recreational or protected areas.

Acknowledgements

This paper presents research results of the Strategic Project of e-GEO (PEstOE/SADG/UIo161/2011) Research Centre for Geography and Regional Planning funded by the Portuguese State Budget through the Fundação para a Ciência e Tecnologia.

The work presented in this communication was funded by the Fundação para a Ciência e Tecnologia (Grant SFRH/BPD/76893/2011).

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Where are the top destinations? Assessment of the online data from activities related to geographic position

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Internet is a huge and easy-to-access source of information, including data about visitation of various localities. Such data is searched by managers of protected areas, sometimes it is really time and money consuming activity, when done manually or with various sensors and dataloggers. In this contribution, following activities have been studied: Geocaching, Waymarking, GeoSpy, Munzee and TripAdvisor. Data from such internet-outdoor activities are free. However, there are limits of the quality of the data, which may differ country from country and may change in time. But the data could be very useful and ready-to-use. No standardised methodology was used for this contribution, all the activities have been analysed for their rules, for the ways of usage by their users, for conditions of the field part and for amount and quality of data about visitation of localities.

Geocaching – www.geocaching.com

Situation

Geocaching was established in the U. S. A. in 2000 and has already spread all over the world. In developed countries the cache density is high. For instance, the density is 0.71 caches per km2 in Germany and 0.03 in Estonia (Vítek 2012). Cache containers must not be placed closer than 0.1 miles to each other that limits the density.

There are several types of geocaches, majority of them are represented by a container hidden somewhere and the finder must sign in the paper logbook in the cache prior to logging his visit on the cache web page. Most caches contain only one point to visit, but some of them (especially multicaches) lead the cacher through several points to find the final location. In some countries, i.e. Poland, opencaching (the same activity but with almost no rules) should be observed as well because of its higher popularity.

Data useful for visitor monitoring

All logs from finders (found / did not find / note) are stored on a geocache webpage including the date of the visit and are accessible for everyone. Each found-it log represents at least one person that attended the locality. Most of did-not-find logs represent a visit as well, but it is recommended to read the log to ensure about that. A note could also represent a visit in some cases, for example from a cacher who found it previously and came here again. From this data average visitation per month or per year can be evaluated. For comparison of higher amounts of caches only total number of found and did-not-find logs could be taken (these are listed in total on the web page), the date of cache publication must be taken into account.

Waymarking – www.waymarking.com

Situation

Waymarking originated from geocaching in 2005. Waymark has no container and the visit is proven by a picture from camera uploaded with log on a waymark webpage. Waymarks are sorted in 1074 thematic categories (creating new ones is still possible) and there is no limit for the placement in opposite to geocaching. The highest density of waymarks according to states is in Vatican (159 waymarks/km2). There is much less waymarks all around the world than geocaches: over 500,000 in total, the density in Germany is 0.032 and in Estonia 0.005 waymarks/km2. Often the same feature (position) could be found as different waymarks in different categories, as most of categories are user-created and could overlap. The map application is uncomfortable, which could be a reason for limited number of users. Finders' logs consist only of a date, a comment and a picture.

Data useful for visitor monitoring

Visitation data could be analysed in a similar way as in geocaching with a respect to much lower numbers of finders. For example, only four visits are logged so far for the Tallinn Airport waymark created in 2006. The number of waymarks or the number of waymark creators in an area could be used instead.

GeoSpy – www.geospy.org

Situation

GeoSpy is similar to Waymarking, but much younger (2013) and with a comfortable map application. There are only 12,000 objects so far, sorted in five main categories (each has 7-8 subcategories). The objects do not overlap; one registered object can be described with more additional categories (similarly as keywords) for searching purposes.

Data useful for visitor monitoring

Utilisation of the data is similar to waymarking data. For visitation analyses, establishing objects of similar type at the same time could be recommended. Current low density of GeoSpy objects is therefore a temporary advantage for visitation monitoring. Favourite points of the place could be assessed as well.

Munzee – www.munzee.com

Situation

Munzee objects are recognised by a QR code in the field. Visit has to be recorded online from the place, therefore mobile internet connection is needed. Munzee density is limited with the distance between each, which is 150 ft between munzees of the same player and 50 ft between munzees of different players. There is over 1.5 million munzees deployed, almost 16 million visits logged and over 160,000 players registered worldwide. The most visited munzee is in Denmark and has almost 2,500 visits.

Data useful for visitor monitoring

The number of visits of a particular munzee and munzee density in an area seem to be helpful for monitoring of visitors.

TripAdvisor – www.tripadvisor.com

Situation

Trip Advisor is a much different activity by its philosophy from the above mentioned ones. It was developed to share experience with tourist destinations – often hotels and other services. The database of places is huge – over 1,700,000 only in Europe. Described and assessed places are distributed all over the world where tourists come. Although users are encouraged to share their experience, not all of them do that.

Data useful for visitor monitoring

Visitation data could be estimated from the number of reviews by each place. All the reviews contain satisfaction assessment and are written in English, that is a significant advantage compared to previous games.

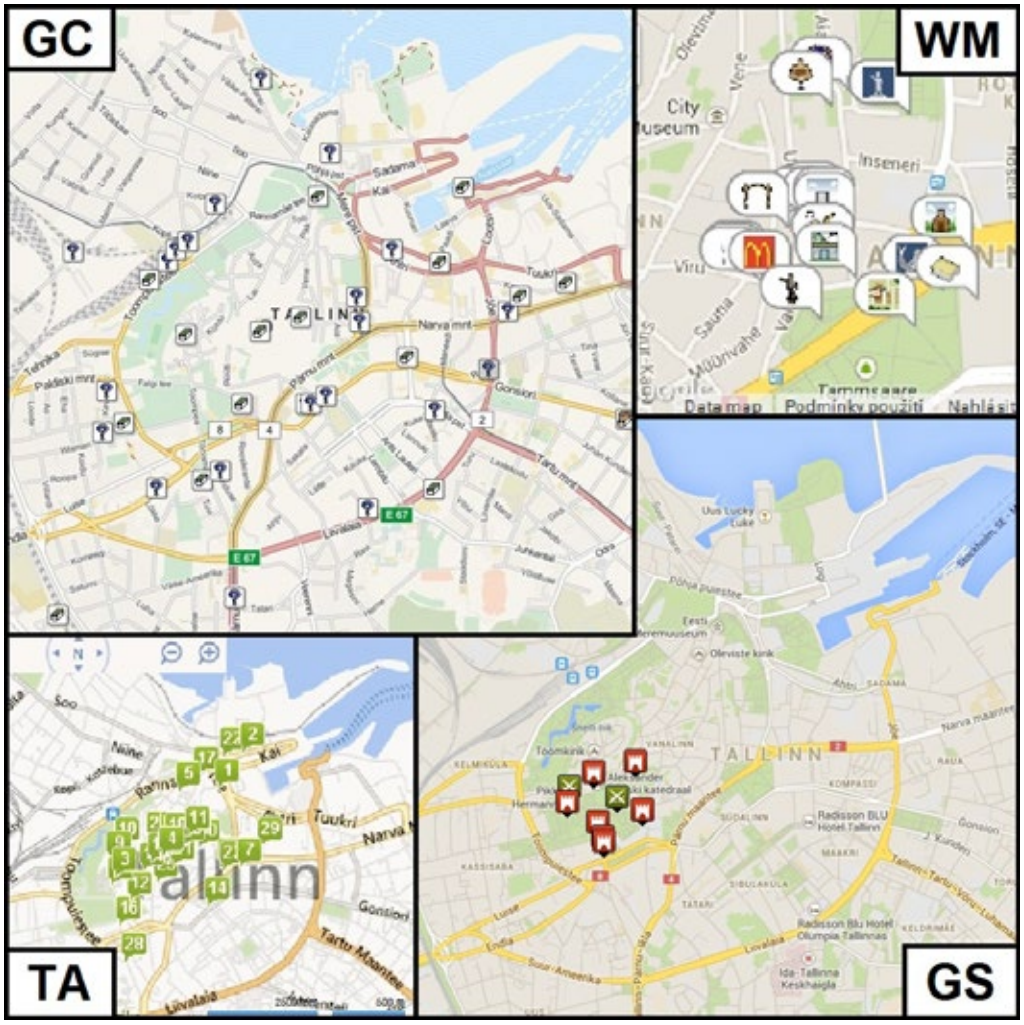

Fig.1. Situation of geocaches (GC), waymarks (WM), GeoSpy objects (GS) and TripAdvisor places (TA) in Tallinn.

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An app in the park: a phenomenological study of park visitors' use of mobile digital applications in a Canadian park

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Introduction

Mobile digital technology has become a core part of how people live their lives. Connectivity is increasingly limitless, even in many wilderness areas. Some have warned that the presence of technology has the potential to change nature-based experiences, and indeed the very meaning of nature (Borrie, 1998; Cuthbertson *et al.*, 2004; Shultis, 2001, 2012; Stankey 2000). Nature, when mediated by mobile information and communication technology (ICT), is shaped and transformed by these actions – for better and worse (Wiley, 2005). Others suggest mobile ICT has become too all encompassing in our lives, and that humans need places and times where they can be digitally disconnected. Some propose that nature parks should serve this purpose. There are however many proponents who suggest that facilitating mobile ICT use in parks affords opportunities for enrichment, social connection, learning, and safety provision.

Background

In this presentation, results from an exploratory study of park visitors' experiences of interacting with mobile digital technology will be reported. This research addresses a growing challenge that park managers face, the need to make decisions about how and where to offer mobile ICT services to visitors. Park managers are striving to connect individuals to the heritage that parks conserve and protect so that the public see parks as relevant, important, and as places that should be supported. In recent decades a decline in visitation to several Western countries' park systems has been documented. Adding mobile ICT services to their suite of offerings may attract priority market segments (e.g., youth and families) to parks and result in park experiences that are meaningful and memorable resulting in positive visitor intensions such as plans to return, recommend and support parks. Alternatively increased delivery of mobile ICT opportunities may alienate other market segments. An examination of visitors' use experiences of mobile ICT in parks will provide insight into this issue, thereby informing park agencies decisions regarding visitor-related ICT investments.

The second major problem this study addresses is the lack of understanding of the outcomes people experience when they engage with mobile ICT in nature contexts. Park tourism and recreation planners can only speculate about the type of experiential outcomes derived from mobile ICT use in parks and what produces these outcomes. Mobile ICT may enrich, entertain, educate and make visitors feel safe. However it may also distract visitors, inhibiting their ability to immerse into and connect with heritage contexts producing fewer opportunities to emotionally connect and experience positive outcomes traditionally associated with park visitors such as mental restoration, physical fitness and (non-virtual) social bonding time with friends and family. A small number of studies have found that having access to mobile ICT in wilderness areas decreases park visitor's perception of risk and increases risk-taking activities (Holden, 2004; Martin & Pope, 2012; Roscher, 2009). Mobile ICT devices have been criticized for their ability to disrupt individuals' attention from their embodied geographic and temporal contexts. For example, a study of mobile device use on an environmental education trail adults reported being distracted by the digital guide more so than a paper-based guide (Rutchter, 2010). In contrast, educators have observed students' increased attention to environmental education tasks when using digital aids (Chavez, 2009; Ruchter *et al.*, 2010; Uzundoylu *et al.*, 2009).

Methodology

To begin to address these issues, a phenomenological study of park visitors' use of mobile applications on hand-held digital devices was engaged in. For this exploratory study the park visitors' were a sample of undergraduate students engaged in an outdoor education course (n=14). Through participant observation and post-ICT use focus groups students' experience of mobile digital technology during a two day park visit was examined. Students were asked of uses of mobile digital technology. For the first task two teams of 7 students engaged in a geocaching exercise that was performed over 1.5 hours with GPS units. The second task involved the use of a star gazing app (Star Tracker) on an Android tablets. Two students each shared a tablet to perform a series of star, constellation and factual searches. Research assistants accompanied and observed the students as they engaged with the digital experience. This digital use was followed by two focus groups ($n \leq 7$) where researchers asked students about their experience with the applications (usability, enjoyment, etc.). Structured observation sheets and semi-structured interview scripts helped to frame data collection. These along with extensive debriefing between data collectors attempted to ensure inter-rater reliability. Venkatesh *et al.*'s (2003; 2012) Unified Theory of Acceptance and Use of Technology (UTACT2) guided the initial assessment of mobile device and application use.

Outcomes arising from the use of the technology such as disruption or enhancement of nature experience, connection with park and nature, increased knowledge of the environmental subject being interpreted and perceived appropriateness and acceptance of such technology in a park experiences were also documented. Similar observation approaches have been used to study shopping experience (Fung & McCarville, 2011) and cell phone use (Park *et al.*, 2013). Data collection also entailed the documentation of visitor and trip characteristics (e.g., group socio-demographic traits, trip motives, park and trail history, ICT familiarity).

Next steps

Analysis of data is currently being engaged in. An existential-phenomenology approach is guiding the analysis of participants' experiences. Existential-phenomenology allows for analysis of context-dependent, 'live-in' experiences (Thompson *et al.* 1989) and has been used in mobile phone use studies (Grant & O'Donohoe, 2007; Shim, Ahn, & Shim, 2006). It is hoped that this study will produce an understanding of the outcomes of ICT use visitors experience and what aspects of mobile ICT produce these outcomes. Initial field-work de-briefs between the data collectors reveal several interesting preliminary reactions to the mobile digital technology experience. These included: during the geocaching exercise students often failed to attend to the natural environment around (exceptions included notice of biting insects, moose dung, and small frogs), the emphasis instead was on the task of finding caches and racing the other team to completion; (b) a preference for the more visually sophisticated Android tablet over the simple digital display found on the GPS unit; (c) use of digital devices rapidly became 'routine'; and (d) a failure of nearly every student to highlight a nature-related element, when asked, "what was the most memorable thing you did today that was related to nature?" Data from this pilot project will also be used to guide the development of an expanded quasi-experimental program of research that is designed to more rigorously examine the impacts of ICT provision to visitors in parks.

POSTER SESSION

Camping on previously unused sites in Fagus forests: Analyzing impacts from different amounts of use to inform visitor management

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Background

In the German national park Kellerwald-Edersee new backcountry campsites were designated in 2009. This was a new approach, as the core zones of German national parks are usually off limits to visitors or are only accessible by dirt roads used for forest management. Thus, the need for research on possible impacts and appropriate management options was a main concern of conservation stakeholders.

Impacts from camping have been studied since the 1960s. A multitude of studies showed have showed that most of the impacts occur at the initial stage of use (e.g. Cole, 2004). But as of date, most research has been done on campsites already in use (Cole and Monz, 2004). Thus, research on previously unused sites is of special importance. Only by studying previously unused sites it is possible to gain further insight in the use-impact-relationship at the beginning of the use history of a site. Furthermore, results from previously unused sites could inform visitor management to decide on acceptable levels of change as well as appropriate management options for newly designated sites.

Methods

Not only is this study unusual in its focus on previously unused sites, it also employs a research design using a regulated scheme of camping intensity to conduct a quasi-experimental camping study. The study focused on impacts on vegetation and soil and did not address other possible impacts, e.g. impacts on wildlife. Furthermore, appropriate management options were analyzed and proposed to the park management.

Based on existing campsite impact assessments (e.g. Marion, 1991; Leung and Marion, 2000) a multi-parameter-approach was employed. Accounting for the characteristic of the study area an adapted set of parameters was defined. This parameter set comprised visual impacts, indices on vegetation, soil and organic litter. Furthermore, hemispherical photography was used to measure understorey light conditions and to define canopy cover classes. Photopoint monitoring was used to document additional changes. Images were used for visual campsite assessment and were not analyzed using software (c.f. Monz and D'Luhosch, 2010)

Campsite use was only possible by registering with the national park administration. Thus, visitor numbers were provided by the park administration and visitor use-levels were calculated as visitor nights per year.

Prior to any use of the 12 campsites used in this study, baseline data were gathered. The defined parameters were collected on a total of 240 permanent sampling points. From 2009 to 2012, the parameters were monitored twice a year on the sites as well as on control sites in the vicinity of each campsite. To account for the impacts from different amounts of use, a scheme of camping intensity defined four classes of campsites with different use-levels.

Results and discussion

Results from this study show significant impacts on vegetation cover and cover of organic litter. Results show no impacts on depth of organic litter, soil compaction and soil moisture. No damages to trees were recorded. Photo monitoring showed impacts on the composition of the organic litter. Furthermore, impacts on campsites with different canopy cover classes are compared. Results indicate that the loss of ground vegetation cover was a function of canopy cover class. Analyzing the results by canopy cover classes combined with use-level classes allowed for more detailed interpretation.

Management implications

The studied parameters as well as the applied methods were analyzed in order to build a reduced set of parameters as a basis for long-term monitoring of the campsites. A crucial criteria in building this parameter set was the capability of the park management to conduct these future activities. Further recommendations for a monitoring scheme by the park

management are given.

Campsite management options comprise, amongst others, defining number of campsites and establishing a maximum use-level as well as the spatial management instruments of concentrating, dispersal or rotation (see Cole, 1981; Marion, 2003). With regard to the study area and the associated impacts concentrating use was identified as the best management option. Detailed recommendations for the future visitor management of the backcountry campsites are given.

Conclusion

The results could contribute to basic understanding of camping impacts in Fagus forests. As research on campsite impacts is limited in Europe, the results of this study could also provide comparative data for the numerous findings on campsite impacts generated elsewhere. Results also add to the knowledge of the relationship between amount of use and intensity of camping impact in general. Combining long term monitoring and adaptive management options, the park management will in future be able to control resource conditions of the new established backcountry campsites.

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Recreation research trends of MMV, 2002-2012

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Keisuke Kumagal, Nagano University, Japan

MMV1

During my work at the National Institute for Environmental Studies, I had investigated the work of Wilfrid Kirchner to find recreation activities' studies in Europe. He had already left by 1996, and Marija Kirchner in Vienna told me that his work had already stopped. Through her I met Arne Arnberger of Bodenkultur University. After meeting him, I received the announcement of MMV (Management and Monitoring of Visitor) in Vienna in January 2002.

We participated in this meeting MMV1 with results about the over crowding of the Japanese Garden called "Koishikawa Korakuen". Our colleagues from the Tokyo Metropolitan Government introduced a survey of usage of 69 prefectural parks in Tokyo from 1982-1998.

At that workshop, there were 81 reports from many countries of Europe and from the United States. I was the only contributor from Asia.

Trends from MMV2 to MMV6

MMV2 was held in Rovaniemi City (60 000 inhabitants) in the Arctic Circle of North Finland, and the theme was "Policies, Methods and Tools for Visitor Management". The participating countries were from North America, the German linguistic sphere and Eastern Europe. Sixty presentations were reported in the proceedings with 20 participating countries.

MMV3 was held in Rapperswil (7500 inhabitants), in a suburb of Zurich, Switzerland. There were many presentations from Swiss researchers. Seven papers from Japan, Taiwan, South Korea, Nepal, and Kazakhstan from Asia were presented. Due to the popularity of the tourism destination, Switzerland, the participants came from all over the world and the meeting was recognized as an important international research meeting. The theme was "Exploring the nature of Management". It had the second largest number of presentations (151) and 34 countries joined.

MMV4 was held at the hot spring resort of Montecatini Terme (20,000 inhabitants) near the big city of Florence, Italy. The subject was "Management for protection and sustainable development". Many presenters were from Italy and Austria, and the total number was 117. Notable are the presentations from Greece and Romania.

MMV5 was held at Wageningen (40,000 inhabitants) in the Netherlands, and there were many presentations from Western Europe, especially from the Netherlands. The subject of the meeting was "Recreation, tourism and nature in a changing world". The total presentation numbered 138, and 36 countries joined.

MMV6 was held in Stockholm, the capital, Sweden. The number of participating countries was the largest - 41. The participating countries ranged from South Africa and Latin America, indicating that MMV had been recognized around the world. The subject was "Outdoor Recreation in Change– Current Knowledge and Future Challenges". As well as nature conservation and user measurement, the research subjects touched widely upon the issues of resource protection and use by tourists . This manifested itself in an increased attention to the problems of landscape assessment.

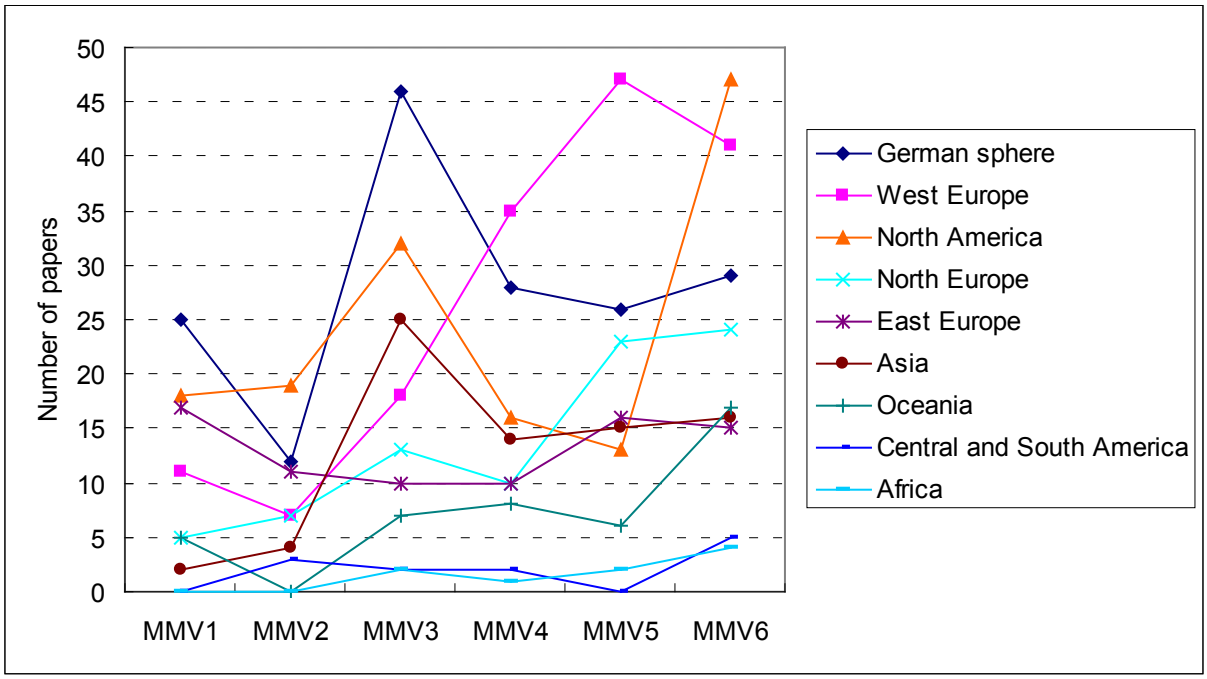

Fig. 1 Trends in participating countries

Trend of research subjects in MMV

Counting of words used in the presentation title revealed following patterns. The subject of tourism increased in popularity to reach the top place at MMV6. The second popular subject was the impact of tourism. Children as visitors also increased. The type of area, National Park and Nature Conservation peaked at MMV3.

Measuring the number of users was the central theme at first, but topics diversified to include the problem of nature protection of the national parks, and the problem of facility development. In addition, this trend is ongoing and we are now dealing with complex problems in recreational activities, cross-cultural issues, such as conflict between activities in recent years.

Research first began from the measuring of the number of users, e. g. mountain walking in the mountain, jogging, wandering, and hiking, then gradually included also studies of recreational activities using equipment, e. g. skiing and biking, and canoeing.

Then the measurement included the relationships between facility development, the locals and the planning of a wide area. Biological protection, water pollution, garbage, conflict with surrounding communities, protection of world heritage, and nature of Antarctic tourism are now being discussed at MMV.

Trends of research methods in MMV

We reported the problems of over crowding of the urban parks studied in the 1970s using counting method at the entrances, but Tetsuya Aikoh and Arne Arnberger reported a new method of montage to show the number of users, not only in the mountains but also in the urban parks. They investigated feeling of usage density in a place with the help of montage slides in the 2000s.

From MMV1 to MMV6, the use of questionnaires increased, as did the use of GPS recently. The counting method is still used.

At the MMV6 in 2012, the increase of complicated studies, e.g. with users of different ethnic and cultural backgrounds, the increase of different uses in the same area, a different capacity calculation, the diversity in resources, the usage control of the concentration at the time, the social carrying capacity problem, and the impact on the landscape experience required new methods.

Conclusion

MMV contributes greatly to scholarly information exchange. To continue to do so, it should ideally be held in a wide range of countries around the world, including new geographic regions (e. g. Asia).

Acknowledgements

We thank Prof. Tetsuya Aikoh of Hokkaido University, Prof. Christiane Brandenburg and Prof. Arne Arnberger of BOKU University, Austria for their participation in projects in Japan and Austria.

We also thank Dipl. Ing. Marija Kirchner and Prof. Toshiyuki Hanaoka of Yamanashi University, Prof. Hitoshi Fujita of Aomori University, and Mr. Rokuro Fuse of Tokyo Metropolitan Government for their kind help with our research. We further thank Prof. Koichi Hosono of Kyushu Sangyo University, Prof. KeeChoel Lee of Kyungpook University, Prof. Nobuo Mishima of Saga University, Prof. JunHua Zhang of Chiba University, Dr. Naturwissenschaftlerin Beatrix Elsasser, Ms. Cathy MacGregor for their report on the recreational research.

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Outdoor recreation, biodiversity and climate change adaptation: challenges for protected area management

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Introduction

Outdoor recreation destinations have to develop strategies for a sustainable development that include the conservation of biodiversity, adaptation to climate change and the reduction of greenhouse gas emissions by using renewable energy. Based on previous findings (Lupp *et al*. 2013), the aim was to raise awareness among different stakeholders in outdoor recreation destinations for these issues. In a participatory approach using scenarios with a timeline up to 2030, integrated strategies were developed by stakeholders. Challenges to be tackled were increasing visitor numbers, integrating climate change mitigation and adaptation as well as better protecting biodiversity. A major focus was to integrate the use of renewable energies in sensitive and valuable protected areas. The three German case study areas Southeast Rügen Biosphere Reserve, Feldberg Lake District Nature Park and the Large-Scale Conservation Project Feldberg-Belchen-Oberes Wiesental served as case study regions.

Materials and Methods

To develop and analyze strategies, a spatial scenario method described in Starick *et al*. (in print) was applied. It allows the integration of stakeholders and participation in all steps of the scenario development. Using the spatial scenario method, drivers that determine possible future states can be evaluated, understood, and strategies to react can be developed. Based on previous stakeholder work (Lupp *et al*. 2013), important drivers were identified and two scenarios in line with Braun (2009) were developed and implemented by stakeholders in the study areas (Table 1).

Table 1: Drivers of the two scenarios "Wellness" and "Adventure", scenarios based on Braun (2009)

	Wellness	Adventure
Climate Change	IPCC A1B (IPCC 2007)	
Energy policy targets	30% renewable share of electricity production by 2030 (BMU 2012)	
	Large power plants	Small decentralized
Visitor numbers	+20% overnight stays, 50% more day visitors (set by stakerholders and project team)	
Visitor increment by	Elder persons	Younger persons
Activities	Hiking, (E-)biking, reduction of winter sport activities	Hiking, biking, different adventure sport activities, more demand for winter sports
Infrastructure	Well maintained trails, easy access	Infrastructure for adventure activities, trails for each activities
Mobility	Preference for public transportation	Preference for car use
Visitor awareness	No acceptance of landscape changes	Acceptance for landscape changes, wind turbines are also used for adventure sports

Results

First, stakeholders rejected planning in the protected areas at all. After a while, they realized that it would be impossible to keep visitors away from the attractive sites like mountain peaks or shorelines situated in the protected areas and tried to find solutions to manage visitors and place infrastructure for the different recreation needs.

Renewable energy was not integrated to a large extent, although e.g. win turbines were considered to be acceptable from an aesthetic point of view and demanded by visitors for adventure sports facilities at least in the "Adventure Scenario". While energy crops like corn, cereals and also short rotation coppice were not considered appropriate, alternative feedstock for biogas plants like wild flowering plant mixtures were perceived to be able to generate synergies and could also generate values for tourism and tolerable in the study areas with their high share of protected areas (e.g. E-bike tours to a biogas plant running with alternative energy crops, alternative energy plant labyrinths). One idea for the Rügen Biosphere reserve was to re-establish traditional coppice in some places and involve tourists to manage them.

Discussion and Conclusion

It could be shown that outdoor recreation, adaptation to climate change and conservation of biodiversity can create synergies for a sustainable regional development, when key stakeholders collaborate in spatial scenario planning to develop solutions for future challenges. Renewable energies can be integrated mainly by the use of woody biomass and residues from landscape management in the selected study areas.

Particularly, adaptation to climate change is perceived as an issue of the distant future, and creates little motivation for stakeholders to act at present. Participatory approaches and stakeholder involvement only generate interest and willingness to take part when more day-to-day issues such as visitor management or protection of biodiversity are considered to be issues for which the stakeholders can find appropriate solutions. Combining climate change adaptation with action for more urgent nature protection and outdoor recreation issues seems to be useful. At least, in Germany, nature conservation is considered important among all members of society, and there is a great willingness to act decisively (BfN 2011).

Acknowledgements

The work was supported by the German Federal Agency for Nature Conservation with funds from the German Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (Funding Number FKZ 3510 87 0100). The authors thank all the participating stakeholders for their contributions in the workshops.

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Community based outdoor recreation planning: an international collaborative venture between Korea and Indonesia

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Background: MOU between the Korea forest service and the ministry of forestry Indonesia

Memorandum of understanding between the Korea Forest Service of the Republic of Korea and the Ministry of Forestry of the Republic of Indonesia on strengthening forest recreation and ecotourism in forest conservation areas in Indonesia on the 12th day of October 2013'. The objectives of this Memorandum of Understanding (MoU) are to strengthen forest recreation and ecotourism in forest conservation areas in Indonesia through mutual cooperation.

Scope of cooperation: Community based outdoor recreation planning

Indonesia has 27 million ha of natural landscape and areas protected for ecological conservation, representing outstanding potential. However, with only 2 million dollars in annual ecotourism revenues, there is a need for development and improvement. To this end, our first step was to establish a master plan. This was in response to an official request by the Ministry of Forestry in Indonesia regarding practical measures related to South Korea's intensive forest recreation and ecotourism concept development. The plan also involved technology transfer and dispatching experts.

Since any suitable plan must be based on detailed and accurate research on Indonesia's current social and humanistic conditions, as well as on its natural ecology and landscape, it requires cooperation with Indonesian experts. Furthermore, achieving the goal of effective project implementation requires forming a partnership through delegation of responsibilities in establishing the master plan. The master plan comprises of basic conception, studying target area conditions, reviewing prior cases, basic planning, management and operation planning, promotional programs, and public relations planning.

The parts of the plan that deal with its conception, direction, and theme, the analysis of the natural environment and socio-humanistic conditions of the target area, and management and operation planning will be carried out jointly with the local research team. The Korean research team will review the case study of Korea and its applicability to Indonesia. It will also be responsible for the development of a tour program appropriate for the target site, and for public relations planning.

The community-based tourism is most important conception nowadays, therefore effective planning for economic development of local community plays important role in this project. The effective planning means finding solutions for the problems, which have raised in economic, geographical, and organizational contexts of community and strategies for effective planning based on residents-led community development.

In particular, it is highly important to secure the understanding and cooperation of the Tunak locals, who are somewhat conservative. Therefore, it might be necessary to modify the master plan in accordance with public hearings with the local residents.

Target area: Tunak, Lombok Island, Indonesia

Lombok is an island in the West Nusa Tenggara province of Indonesia. It is part of the chain of the Lesser Sunda Islands, with the Lombok Strait separating it from Bali to the west and the Alas Strait between it and Sumbawa to the east. Gunung Tunak Natural Recreation Park is a natural recreation park located in Mertak Village, District Central Lombok. It was appointed by Minister of Forestry in 1996 covering the area of 312 hectares and declared by Minister of Forestry on August 4, 1997. In 1998, the area was extended into 624 hectares. Historically, before it was declared as national recreation park, Gunung Tunak was established as production forest for concession and community forest. Tunak has low land rain forest vegetation and a small part of highland rain forest.

Implementation philosophy: The value of volunteering and creativity for SAEMAUL spirit in the 21st century Indonesia

The New Community Movement, also known as the New Village Movement or Saemaul Undong [Movement] was a

political initiative launched on April 22, 1970 by former South Korean president Park, Chung Hee to modernize the rural South Korean economy. The idea was based on the Korean traditional communalism called Hyang-yak and Ooorae, which provided the rules for self-governing and cooperation in traditional Korean communities. The movement initially sought to rectify the growing disparity of the standard of living between the nation's urban centres, which were rapidly industrializing, and the small rural villages, which continued to be mired in poverty. Diligence, self-help and cooperation were the slogans to encourage community members to participate in the development process. The early stage of the movement focused on improving the basic living conditions and environments whereas later projects concentrated on building rural infrastructure and increasing community income. The Saemaul Undong is believed to be one of the major factors that contributed to the rapid economic growth of Korea. The 3 Key Spirits of SAEMAUL Movement should be developed according to changed circumstances and reality in Tunak, Lombok. The cooperation: empowerment of residents to lead the community as citizens in a democratic society and creating a system to secure their pivotal role in establishing local community organizations; the hard work: economic development through the community spirit of residents and residents' self-leadership, the self-help: resolve community problems and to encourage potentials of community residents and their participation.

Expected Results

With the successful completion of this master plan, along with the designation of ecotourism sites, and the design and building of necessary infrastructure set to begin in 2015, the outcome from the revitalization of Tunak area is expected to be significant.

The current afforestation project on 200,000 ha of land is an example of forestry sector cooperation between South Korea and Indonesia. However, establishing cooperation between these two countries in forest recreation and ecotourism will serve to boost forestry welfare, recreation, and restoration. In addition, the establishment of a community-based ecotourism plan that maximizes the use of natural ecology and the traditional cultural characteristics of the Tunak region may revitalize the local economy. With community development and the establishment of a continued revenue stream, an improvement in the locals' living conditions can be expected.

The Saemaul Movement enabled rapid economic growth in the 70's and 80's in South Korea. A similar movement in Indonesia might serve as the foundation for sustained growth in the community. It might promote the awareness of local residents and inspire them to improve. It could also aid in community development strategies and transfer of techniques.

Figure. Community based outdoor recreation planning in Tunak, Indonesia

"Reloading my batteries" in grey places or green spaces? Cross-over experiment with adolescents in environments differing in closeness to nature - first results on wellbeing

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Background

School life challenges pupils' wellbeing as well as cognitive skills. Time to recover during a long school-day is crucial. Where should school children and students stay during a rest break to most effectively restore cognitive function? Several studies in adults have identified positive effects of green spaces on well-being and various indicators of health: Cross-sectional studies indicated exposure to natural environments as associated with increased well-being (e.g. de Vries *et al*. 2003) and improved mental health (e.g. Sugiyama *et al*. 2008). However, effects of natural environments on adolescents have received little attention so far.

The need for recreational breaks during school hours has since long been recognized. However, the environmental settings during breaks that provide the best opportunity to prevent from deterioration of performance and well-being have not been studied. Positive effects of green spaces on well-being and various health indicators indicate that natural environments could be of particular relevance for retaining performance and wellbeing.

Within a multidisciplinary approach this study investigated effects of staying in different urban environments and green spaces during breaks on well-being, cognitive performance, and cardiorespiratory function of adolescents, funded by the research program "Sparkling Science" (Austrian Federal Ministry of Science and Research).

Methods and material

Healthy pupils (n=64; 16-18 years old) of three schools in Vienna volunteered in a cross-over field experiment. On different days at least one week apart, students stayed in each of three settings (small park in an urban area, a large park, a forest) for one hour during a lunch break. Access times to each site were about 20 minutes from schools.

Wellbeing was assessed by standardized questionnaires (self-condition scale by Nitsch, 1976). Subjects characterize their actual state by 27 attributes. Cognitive performance was tested with d2 Test of Attention, a timed test of selective attention (Brickenkamp & Zillmer 1998). Both, questionnaires and cognitive tests were applied before, during and after the break. Furthermore, the Perceived Restorativeness Scale (PRS) was administered after the break. The PRS is measuring four dimensions of a restorative environment and consisted of 16 items designed to measure qualities of person-environment transactions (being away, fascination, coherence, and compatibility [Hartig *et al.* 1997]). This measurement allows a distinction between environments concerning their potential for restoration of attention. In addition, satisfaction with the visit and crowding perceptions were asked.

Effects on the cardiorespiratory system were investigated by measurements with peak flow meter and pulse oximeters. Levels of particulate matter (PM10, PM2.5, PM0.1), carbon dioxide, indoor climate factors (temperature, humidity) and noise were determined by standardized measurement procedures.

Results

In total, data from 60 students (30 male, 30 female) were available. The starting point concerning self-condition was virtually the same for all three investigation days after the first measurement - at a comparatively low level. Well-being (esp. readiness for exertion, alertness, recuperation) was higher in all outdoor settings. However, a sustained effect was only found for the near-natural setting of a stay in the forest (Figure 1).

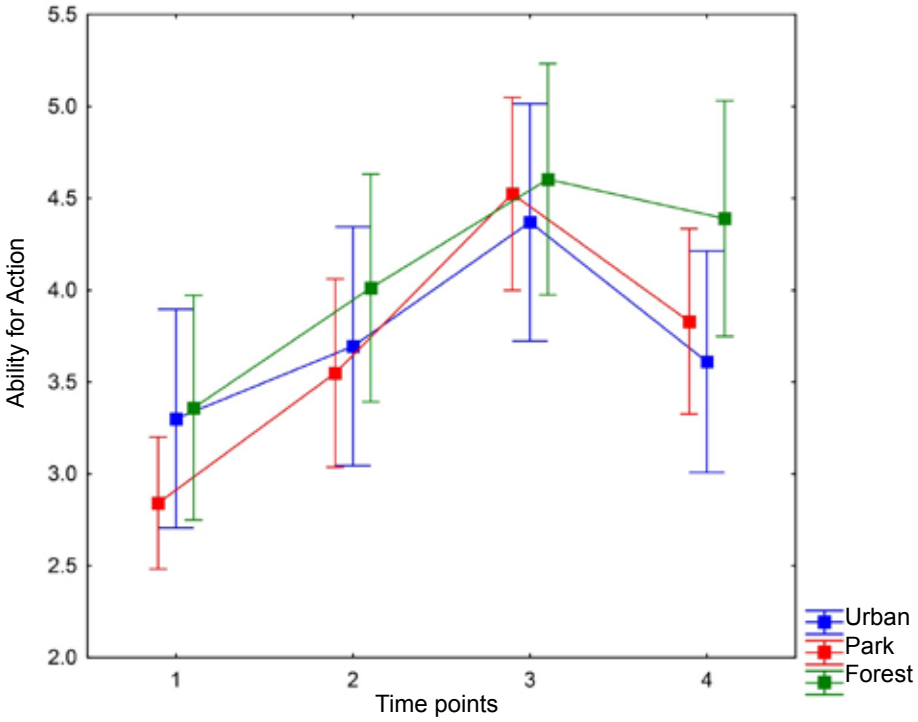

Fig. 1. Mean and 95% confidence interval of the stanine values of the current Ability for Action (Nitsch scale) at the four time points (1=before leaving, 2=arrival, 3=leaving, 4=back at school) and three locations.

Overall, pupils were rather satisfied with their stays at the study sites. The forests received the highest satisfaction scores, while the small urban parks scored the lowest. However, a stay in a larger park often received the same scores as a stay in a forest. Staying in a forest, however, was associated with a more sustained effect on wellbeing as compared to the other environments.

Discussion

Previous studies have suggested positive effects of green spaces on diverse health-indicators. We found such an effect of nature on adolescents' wellbeing, in the sense of recovery from negative mood and reduced readiness to act. Such positive effects are important regarding challenges of every day school life.

As these are preliminary results, further analyses are planned (e.g. including data of d2 tests, PRS, environmental measurements). Furthermore, the students will develop strategies to integrate restorative effects of specific places/ activities into their daily resp. school life. Results will be presented to public health officials, city planning authorities and environmental stakeholders.

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Sustainable transportation in national parks: A Review and synthesis

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Transportation and national parks are intimately and inextricably linked. For example, nearly 300 million visitors per year travel to and within the U.S. national parks. Moreover, American national parks comprise over 80 million acres of public land and include extensive networks of transportation corridors – roads, trails, bike paths, waterways, public transit – that link a vast array of iconic attraction sites – viewpoints, historical and cultural sites, visitor centres, campgrounds, gateway communities. In many cases, transportation is an important form of recreation itself (e.g., driving for pleasure). Transportation can also be an important park and outdoor recreation management tool, helping to deliver the "right" number of visitors to the "right" places at the "right" times. The inherent complexities of the intersection between transportation and national parks demand explicit management attention that includes a coordinated, systematic, and informed approach.

Given the importance of relationships between transportation and national parks, a review and synthesis of the scientific and professional literature on sustainable transportation in national parks was conducted by the authors. The review is divided into five parts. Part 1 begins by outlining the history and associated issues of transportation in national parks. A conceptual model is presented that suggests an evolution from conventional demand-driven transportation management to sustainable transportation management in national parks (Figure 1).

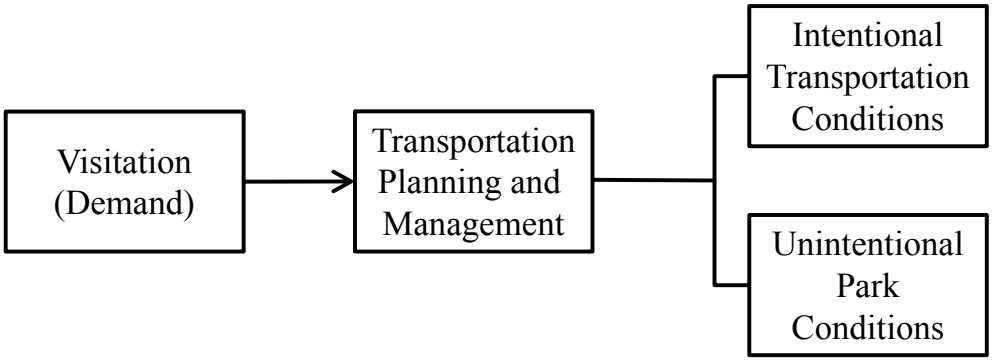
Part 2 addresses the relationship between transportation and national park resources and the quality of the visitor experience. Park resources include wildlife, air quality, noise, soil, and vegetation. The quality of the visitor experience includes crowding/congestion and associated stress, freedom of movement, and ease and convenience of travel. A range of potential indicators and standards of quality for park resources and the visitor experience are identified and illustrate the ways in which these indicators and standards may need to be revised as transportation in national parks evolves from conventional modes of travel to more sustainable forms and systems of transportation.

Part 3 addresses transportation as a tool for managing parks and outdoor recreation, including managing visitor use in a sustainable manner. Issues addressed include the environmental and social carrying capacity of national parks, alternative transportation systems, and intelligent transportation systems. This material suggests how transportation in national parks is evolving from its conventional demand-driven model to an approach that is aimed at protecting park resources and the quality of the visitor experience.

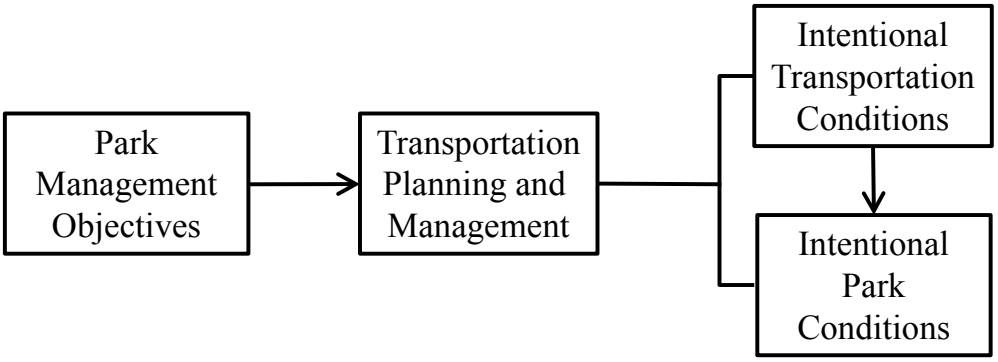
Part 4 presents a series of case studies that illustrate many of the issues outlined above. These case studied describe state-of-the-art transportation research, planning, and management at diverse national parks, including Denali National Park and Preserve, Yosemite National Park, Cape Cod National Seashore, and Zion National Park. These case studies offer successful and attractive models of how transportation can contribute to the sustainability of national parks.

Part 5 integrates and synthesizes much of the information outlined above. It begins by describing how the literature review and synthesis reaffirms the premise that transportation and national parks are intimately and inextricably linked. A series of 21 principles or best management practices is derived that can help guide planning and management of sustainable transportation in national parks and related areas. The study concludes with some observations on the increasing urgency of sustainability in the contemporary world; the leading role that national parks can, should and are playing in this regard, especially in the area of transportation; the importance of alternative transportation systems; and the need for integration across the professional fields of transportation and national parks.

This literature review and synthesis can help guide transportation planning and management in the context of parks and related areas. It can also help the scientific community in identifying important research questions.



a. Conventional (Demand-Driven)Transportation Management Model



b. Sustainable Transportation Management Model

Take nothing but pictures, leave nothing but footprints

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Introduction

Places which have lost their original purpose and have been left to their own after use do not enjoy much acceptance in a society which focuses on economic profit and performance. These so-called "abandoned places" – for which, in German-speaking countries, the term "Lost Places" is used – include abandoned factories and residential buildings, former military sites (e.g. air raid shelters) or public facilities (e.g. hospitals), but also sewage systems. In contrast to the general notion, these places can neither be described as useless nor as dead spaces. As they have become unpoliced and are no longer regularly cleansed, abandoned places are urban nature reserves for plants and animals finding nesting spaces, food sources and territories. In addition to that, there are a lot of functions which abandoned places fulfil in today's society: e.g. accommodation for homeless people, adventurous playground for children or sites for sports like skateboarding or climbing (Edensor 2005).

For the past few years abandoned places have been increasingly visited by people, so-called "urban explorers", who feel attracted to their special atmosphere. "Take nothing but pictures, leave nothing but footprints" is the motto of this leisure activity called "urban exploration". In a master thesis, emphasis is laid on the analysis of the motives of the urban explorers. They are characterised, and an attempt has been made to analyse what kind of abandoned places they prefer to visit and why they practise this hobby.

Method

Dealing with this topic is mainly characterised by two aspects. On the one hand, not much research in this leisure activity has been done so far as it has existed in the present form for a short time only. On the other hand, research with the help of conventional empirical methods (e.g. questionnaire) is complicated due to the low societal acceptance towards the hobby and the refusal of too much publicity within the urban exploration scene. An important aspect of urban exploration is the sharing of adventures with an online community by posting stories and photos of the abandoned places on the internet. Therefore, besides a literature research, an online content analysis of 222 comments posted on four appropriate German websites dedicated to this subject ("rottenplaces", "hidden-places", "fotocommunity", "Urbexers Against Vandalism") was carried out in the course of this study.

The content analysis of already existing online communication shows several advantages:

- You can expect a higher willingness by the probands to reveal personal information within the online community and therefore more open and honest communication contents than with other research techniques (Taddicken and Bund 2010) – which seems to be very important in the case of the present topic. In order to prevent thoughts, opinions or statements from being influenced by an interviewer, there was no intervention into the communication process either (Mühlbacher, Füller and Jawecki 2007, cited in Taddicken and Bund 2010).
- Due to the communication in written form it is reproducibly documented and can be used for content analysis without having specifically been collected (Taddicken and Bund 2010).
- The data are available in the form of digital text modules and can therefore easily be extracted, which considerably reduces time spent on analysis (Taddicken and Bund 2010).

Results

The analyses of both the literature and the online comments show similar results: urban explorers are mainly male, under 30 years old and prefer to visit industrial ruins. These diverse "playgrounds" attract urban explorers, who mostly belong to the middle class and therefore in their everyday life usually frequent places completely different to abandoned factories (High and Lewis 2007).

As can be seen in Table 1, urban explorers are primarily fascinated by immersing into an authentic past (67%) and by the beauty of decay (31,1%), which they try to preserve for the future with the help of their documentation (mainly consisting of photos predominantly taken by ambitious amateurs or professional photographers). The mutations of an abandoned place between their visits – caused by fauna and flora, other visitors or weathering – are part of the enjoyment of these places and contribute to anticipate the inevitable transience of existence. This is in contrast to managed heritage sites, which are maintained in a state of arrested decay and cannot be recognised as living sites of memory (Garrett 2011).

Table 1: Distribution of urban explorers according to motives on the basis of an online content analysis (n=106, up to 3 entries possible)

Motive	Frequency	Percentage
Interest in history, documentation	71	67
Otherness	10	9,4
Atmosphere	24	22,6
Thrill	23	21,7
Decay	33	31,1

Another reason for the increasing attractiveness of abandoned places where apart from urban exploration also other leisure activities take place (e.g. geocaching) is the lack of unregulated urban areas as space is more and more divided up into functional spaces, turned into private property and surveyed to guard against inappropriate uses. This rather risky leisure activity therefore also serves to escape the increasingly regulated urban space and to experience the thrill of the forbidden and unexpected (Edensor 2005).

As the present study shows, urban exploration can be described as a reasonable – in the context of e.g. history research or documentation – and life-enhancing leisure activity carried out on sites, which represent important urban nature reserves. Due to the fact that most urban explorers post their adventures on the internet, monitoring of this increasingly popular activity can easily take place with the help of online content analyses.

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The importance of "nature" in geocaching

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Geocachers and their attitudes towards nature

Geocaching is a modern form of a treasure hunt. Within recent years this activity has become increasingly popular. The game is about hiding small boxes – so called geocaches or caches – in mostly public spaces. Thereafter, the coordinates of these geocaches and hints for finding the hiding place are posted on specific websites for treasure seekers who are equipped with GPS-receivers or smartphones with GPS. Growing numbers of geocachers have been documented within the last years (e.g. http://aj-gps.net).

Geocaching is an activity going on during day- and night-time, in urban areas as well as in natural landscapes. Forests and countryside are attractive for geocaching, whereby geocachers often enter areas that have been so far untouched by humans (Reimoser *et al* 2012). Because the search for the hiding place of the geocache is focused on a specific area, the activity can have negative impact on flora, fauna and land-use and can also cause disturbances for wildlife. As consequence of these disturbances of wildlife damage can be caused by game through browsing.

Methods

In order to learn more about geocachers and the importance of nature for this activity, a survey has been conducted (06-09-2012 to 18-11-2012). Since geocachers are organised through websites, the online survey was considered as a suitable approach to reach this target group. The link to the survey has been posted on several geocaching-websites, on discussion panels and on the facebook-page of geocaching.com, the biggest geocaching-community worldwide.

Besides socio-demographic data of geocachers, the survey also collected data on their spatial and temporal behaviour, their motives for geocaching, as well as their awareness of disturbance of wildlife. Furthermore, the significance of the characteristics of the hiding place of geocaches and conflicts with other people have been evaluated. In total 434 questionnaires have been analysed.

Results

The participants were asked for their motivation for taking part in geocaching, most frequent answers were "new activity in nature" (73%), "new perspective on city/region" (71%), "combining outdoor activity and technology" (65%) and "geocaching can be combined with other leisure activities (e.g. hiking)" (63%).

When asked for reasons to continue participating in geocaching, nature has been an important factor, for instance "experiences of nature" (94%) and "spending time in nature" (93%) were frequently declared as very important or important.

The results of the survey show that geocaching is practised more often in natural landscapes or cultivated landscapes than in urban areas or settlement areas.

The relevance of certain characteristics of geocaches and hiding places has been investigated; the results show that „nature" plays an important role even in those topics. A majority of respondents assessed the location of the geocache "in nature/ natural area" as well as "in secluded areas or areas that are not frequently visited" and "off path" as very important or important.

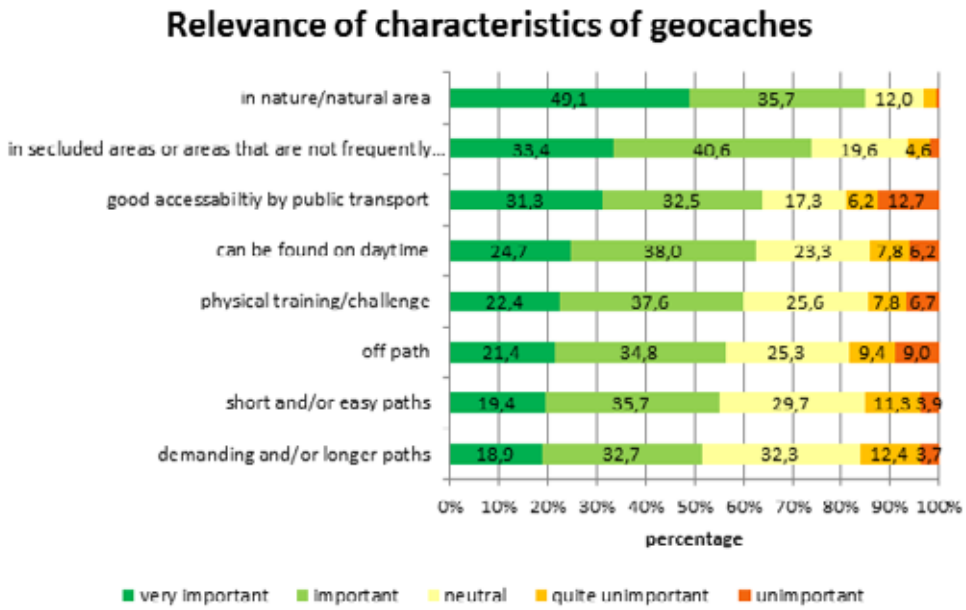

Figure 1: relevance of characteristics of geocaches (n=434)

The participants indicated that the experience of nature in the course of geocaching is evaluated as high. Approx. half of the participants responded to observe more wildlife during geocaching than e.g. during mountain-biking or hiking. About the same amount of respondents declared "the more unaffected and close to nature an area is, the more fun geocaching is for me".

Use of natural hiding places such as tree caves or holes in the ground has been assessed as unimportant or neutral by the majority of respondents. Though, nearly two thirds of respondents agreed with the statement "hiding geocaches in tree caves, holes in the ground etc. is no problem if done carefully".

Participants showed high awareness for disturbances of wildlife. For instance, dogs off leash or noise were assessed as a disturbance or a strong disturbance for wildlife. Furthermore, "entering clearances, glades or feeding ground of game" as well as "visiting forests in dusk or dawn" and "visiting forests in winter" have been classified as disturbance for wildlife. Geocaching itself was assessed as disturbance for wildlife only by a small percentage of respondents.

Codes of behaviour for geocachers can be found on most of the geocaching-websites, furthermore nature conservation or youth organisations developed environmental codes of conduct. The majority of participants stated that they are aware of these codes of behaviour (82%).

Conclusion

Socio-demographic results of the online-survey regarding gender ratio (approx. 72 % male), age (average age 37 years) and education (high level of education) match with the results of other studies (Chavez *et al.* 2004, Telaar 2007 in Reimoser *et al.* 2012). The relevance of nature and experience of nature for geocachers has been documented in other studies (Telaar 2007).

Since the number of geocachers is still rising and geocaching can be regarded as a trend in leisure activities, conflicts with foresters, farmers, hunters or conservationists are likely to occur more frequently.

The results of this survey show that geocachers generally are aware of the problematic of wildlife disturbances. However, geocaching itself is not regarded as disturbing leisure activity – participants seem to blind out that going off the path, taking dogs off leash and visiting e.g. forests at dusk often occurs in the course of geocaching and that this can disturb wildlife.

There seems to be a gap between knowledge and behaviour of geocachers and therefore awareness rising within this user group is necessary. Furthermore, research to quantify the wildlife disturbances and negative effects on nature conservation as well as conflicts with other land users is essential.

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Unintended de-marketing manages visitor demand in Greater Blue Mountains World Heritage Area

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Introduction – de-marketing defined

Kotler and Levy (1971, p.76) introduced the term 'de-marketing', defined as 'that aspect of marketing that deals with discouraging customers in general or a certain class of customers in particular on either a temporary or permanent basis'. Subsequently, Groff (1998) interpreted the concept in the context of parks and recreation administration. Recently, Armstrong and Kern (2011) used the concept to underpin their investigation of visitor demand management within the Greater Blue Mountains World Heritage Area (GBMWHA), Australia. We supported the findings of these researchers, and offer additional examples of de-marketing in this protected area.

De-marketing in the Greater Blue Mountains World Heritage Area

Since the late 19th century, the Blue Mountains National Park, now incorporated into the GBMWHA, has been one of Australia's best-known and most popular nature tourism destinations, especially among day-trippers from nearby Sydney. However, its popularity has waned in recent decades, and there is risk of further decline. For example, during 1999-2009, domestic overnight visitors fell by 45% while international overnight visitation remained generally stable. Day visitors also declined by 59% during 1999-2004 and, despite subsequent partial recovery, in 2009 numbers remained 36% below those of 1999 (Hardiman & Burgin, 2011). Rather than facing excessive tourist demand, as perceived by park management staff (Armstrong and Kern, 2011), the GBMWHA is experiencing a substantial decline in visitation although not as a result of deliberate de-marketing. Whether the decline in demand is sufficient to ensure environmental sustainability is unknown. This is due, in part, to the GBMWHA's large geographical coverage and unfenced boundary, which make it difficult to determine visitor numbers, which locations, and what recreational activities are being undertaken within its boundaries (Hardiman & Burgin, 2011).

In the context of the land managers' vision for GBMWHA, '...[to provide] a range of high quality nature-based recreational experiences ... on an environmentally sustainable basis...' (NPWS, 2001), de-marketing is one approach that could achieve this outcome. However, Armstrong and Kern (2011, p.28) did not find a 'holistic or systematically planned de-marketing strategy' among park management. They concluded, however, that there was 'latent use of de-marketing'. One reason suggested was that 'marketing has not been 'a good word' in the land manager's vocabulary for 'many, many years'. If correct, we suggest that there is a lack of understanding of the marketing concept within the management body, and confusion of the broader concept of marketing (crucially, a matching of supply and demand in a sustainable manner) with marketing communication (e.g., advertising, sales, public relations and other forms of sales promotion).

We concur with Armstrong and Kern's (2011) conclusion that successful promotion of the GBMWHA is lacking. For example, we found that only 16% of international (18.5% domestic) visitors were aware that the area was a World Heritage Area five years after its listing. Few visitors had accessed the GBMWHA's web site (3.0% international; 8.8% domestic) or used the information boards (8.0% international; 10.1% domestic) within its boundaries (Hardiman and Burgin, 2013). This indicates a lack of interest in the marketing to attract visitors, and for the provision of information on the GBMWHA.

Lack of integrated management of recreation and conservation in the GBMWHA was also been commented upon by Armstrong and Kern (2011). While they interviewed staff, we found that, at the broader Regional scale there appeared to be a profound lack of integrated marketing of the GBMWHA as a tourism destination. In addition, Armstrong and Kern (2011) identified 'several' de-marketing measures that unintentionally controlled visitor demand in specific locations within GBMWHA and/or specific user segments. 'Almost all participants' in their study commented on 'limiting recreational activities'. Among the activities that were recorded was canyoning. In our studies we found that after substantial growth in canyoning in the GBMWHA's wilderness areas during the 1990s there was a substantial drop in participation by 2000 when numbers had stabilised. We found that even at its most popular, canyoning had no discernible effect on aquatic fauna; however, management measures were introduced to limit canyoning (closure of vehicle access; limiting numbers allowed on commercial tours). These are typical de-marketing strategies. However, the basis for the restrictions was erroneous since 1) they were implemented after visitor numbers had substantially dropped; 2) most canyon locations are either not visited or visitation is low; 3) most canyoners visit in small groups (2-5), and few canyon with commercial groups; and 4) small off-road bikes bypass barriers, use footpads, readily conceal their bikes in undergrowth while the owner is canyoning, and thus limiting of vehicle access is ineffective. Closure of tracks without information on alternative opportunities for bushwalking, lack of parking and, where metered, its high cost have all contributed to the unintended de-marketing of the GBMWHA.

Conclusion

The concept of undertaking this study was to encourage reflection on their management approach among protected area management staff. It would also be desirable to engage other stakeholders to encourage an integrated, holistic approaches to management of protected areas, in terms of marketing and de-marketing (as appropriate). However in GBMWHA continuation on current downward trends visitation may mean that there will be no need for de-marketing.

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An analysis of attitudes about paying user fees for nature areas in Japan

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Introduction

Intelligent management of all types of nature areas fosters high quality use of those areas, particularly when funding is obtained and limits on entry are instituted. In accord with resources and ways of administration, various entry fees and rules controlling nature area use have been considered or enacted in some nature areas (Ito, 2005). Individual users face direct costs by paying a user (admission) fee and/or user service fees once they are in the park (Aukerman, 1986). In Japan's notable nature areas such as Kamikochi or Okunikko, users often are asked to pay for services (such as the use of public toilets) but are less likely to pay a fee for admission to the area. In fact, most nature areas in Japan can be used for free. Free access to nature areas is linked to the Japanese cultural idea that people and nature are closely related, leading to the assumption that nature is freely there for all to use. This study aims to improve the use of nature areas by clarifying users' attitudes toward paying to use them. The three specific research questions addressed in this study were:

- Do attitudes toward payment differ according to the type of venue?
- Do attitudes toward payment differ according to the method of assessment?
- What is the relationship between individual characteristics of users and their attitudes toward paying to use nature areas?

Methodology

A survey questionnaire for people aged 16 years and older was offered on the Internet throughout Japan in July 2013. A total of 3,599 completed questionnaires were submitted. The survey instrument obtained information on attitudes toward paying to use a nature area based on the type of venue and based on the type of payment assessed using a four-category Likert scale where 1 = "no problem at all" to 4 = "definitely problematic." The four types of venues were 1) public exhibition facilities, 2) cultural heritage sites such as shrines or temples, 3) nature areas, and 4) mountain areas. The two types of payment assessments were 1) general use (admission) fees and 2) fees for using facilities (e.g., toilets). To analyse the data, we first used a repeated measures one-way analysis of variance (ANOVA) to explore whether attitudes toward payment differed according to the type of venue. That analysis was followed by paired-comparison tests of all possible pairs of venues. Next, limiting the scope to two types of venues, nature areas and mountain areas, we used paired t-tests to explore attitudes toward methods of assessing charges. Finally, ANOVA was used to examine the relationship of individual characteristics to attitudes toward payment for the use of nature areas.

Results

The results of the initial ANOVA revealed a statistically significant main effect ($F [3, 10794] = 346.45$, $p < 0.0001$), suggesting that the mean attitudes toward payment differed among the four types of venue. Continuing on with Ryan's multiple comparison tests, statistically significant differences were found for all of the tested pairs except for admission charge for cultural heritage sites versus entry fees for mountain areas. Resistance to pay was the highest regarding an entry fee for nature areas, followed by an entry fee for mountain areas, then an admission charge to cultural heritage sites, and resistance was the lowest regarding admission charges to public exhibition facilities.

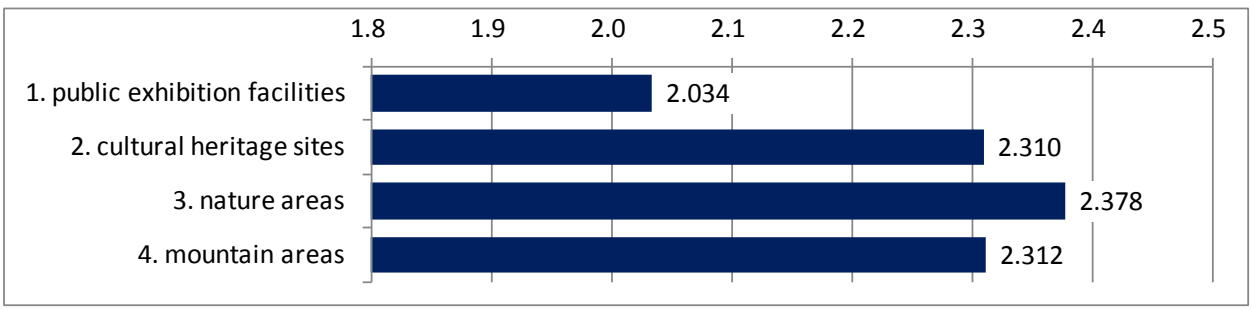

Figure1. Mean differences in attitudes toward payment according to the type of venue (Likert scale where 1 = "no problem at all" to 4 = "definitely problematic")

In the analysis of attitudes toward assessment charges in nature areas, a paired t-test examined differences in attitudes toward paying an entry fee versus a fee for using facilities. A statistically significant difference was found ($t = -4.892$, $df =$

3598, $p < 0.01$). The mean was 2.38 for paying an entry fee and 2.42 for paying a fee for using facilities, suggesting that a fee for facility use in a nature area generated relatively greater antipathy. In the case of mountain areas, on the other hand, a significant difference also was found ($t = 5.510$, $df = 3598$, $p < 0.01$); however, with mean values of 2.31 for paying an entry fee and 2.27 for paying a fee for using facilities, the results conversely indicated a greater resistance toward paying entry than use fees.

The final analysis examined the association of the respondents' characteristics with their attitudes toward paying to use nature areas. The ANOVA test revealed statistically significant differences according to the frequency of having visited nature areas ($F(4,3594)=17.64$, $p<.0001$) and the extent to which respondents intended to visit nature areas in the future ($F [4, 3594] = 51.51$, $p <.0001$). Frequent visitors who were no longer inclined to visit were the most opposed to payment, followed by infrequent visitors who may or may not want to visit again. Frequent visitors who intended to visit again were the least resistant to the prospect of paying.

Conclusion

We conclude the following from these results:

- Resistance to paying an entry fee to a nature area was higher on average than resistance to paying an admission charge to a public exhibition facility or cultural heritage site.
- Aversion was relatively high toward paying fees for facility use in nature areas and toward paying fees to enter mountain areas.
- Attitudes toward payment were influenced by the frequency of visiting nature areas as well as by the extent of the respondents' intention to visit nature areas in the future. Those who had visited frequently but had no future intention to visit displayed the greatest resistance to payment, whereas those who had visited frequently and intended to visit again were least resistant to paying fees.

In Japan, the upkeep of museums and other exhibition facilities usually is borne by the users. Cultural assets likewise tend to be managed at the expense of the users. Nature areas, on the other hand, have no history of assessing fees and resistance among users to paying fees is high. If users are to be made to bear costs, charging them in ways that fit the type of venue will help to institute such costs in ways that provoke the least likely amount of resistance among users.

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Comparison of survey methods to profile participants in emerging adventure recreation activities undertaken in wilderness

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Introduction

Growth in 'adventure recreation', typically practised in protected areas, is occurring. Canyoning (cf. canyoneering), is one such activity. In the Greater Blue Mountain World Heritage Area (GBMWHA), management was concerned that canyoning was causing environmental damage. However, there is a dearth of data, even on participation, because of the 'composite' nature of the activity, its recent emergence, and because adventure recreation is typically restricted to wilderness areas which renders visitor census problematic. Despite difficulties, management need to monitor such activities and a valid, reliable method of survey is required.

For emerging forms of adventure recreation, identification of a representative sample is especially problematic. Often members of enthusiasts' club are surveyed because sampling this demographic provides for an efficient and cost effective survey method, and wide geographical coverage. However, the representativeness of club members of the targeted population is questionable and thus results may not translate to valid/reliable outcomes. Despite issues, we found no concurrent studies of adventure recreation that compared club versus on-site sampling.

Although canyoning in the GBMWHA (Australia) involves thousands of visits annually, no canyoning-specific clubs exist. A composite sport, it requires no specific equipment/clothing, and there are no formal competitive Australian events. The land managers are, therefore, faced with the issue of monitoring participation in, and developing policies for this, and other adventure recreation activities undertaken in wilderness. To inform management's survey methodology choice, we compared two survey approaches.

Methodology

Results of nine questions common to two surveys of canyoners in GBMWHA were compared: a once-off postal survey of canyoners of outdoor adventure recreation clubs; and an on-site intercept survey at canyon track-heads administered in two successive canyon seasons. On-site, effectively all canyoners were surveyed who visited 25 canyons on one Sunday (weekends are most popular, ≥90% of weekly trips, Saturday/Sunday visitation equal), and one mid-week day/month. Sampling dates were randomly assigned for surveying in February 2000 (within 1999-2000 season), and between October 2000-April 2001. Onsite surveying occurred between 0800-1800 hours. Effectively all surveys were self-completed (anonymously) on-site.

Questions spanned respondent demographics, gender, age, size and composition of canyoning group, visit frequency and trends, and attitudes to management's proposed options to manage canyoning. On-site surveys were analysed between seasons, and were compared with club data collected concurrently in 1999-2000. Analyses were by t-test or Chi-square goodness-of-fit.

Results

Comparison between years

Of 24 clubs contacted, 62.5% participated (901 questionnaires mailed [percentage of canyoners within clubs unknown] return rate of 22.9%). In the same canyoning season, 227 on-site usable questionnaires were collected (443 in 2000-2001, >95% participation both seasons).

There was no significant difference between years for gender, age, experience level, visit frequency or trends in canyoning frequency, and attitudes to management policy options (Table 1). Typically canyoners were male, aged between 30-35, lived within the State, were experienced canyoners, canyoned with a small group encompassing 'family/friends', and canyoned ≤2 monthly (equivalent to previous year). They approved of on-park management intervention to limit/hold visitation at current levels rather than lowering use/non-intervention.

Table 1: Comparison of respondent demographics, canyon visit frequency, and attitudes of experienced canyoners to proposed management changes across survey seasons (1999-2000, 2000-2001) and surveys (1999-2000) (sd=standard deviation; ns=not significant; *=<0.05)

Attribute	On-site 1999-2000	On-site 2000-2001,	Club 1999-2000	On-site between years	On-site versus Club survey
Gender (%)	*n*=227	*n*=443	*n*=206	x^2_1=0.225, *p*=0.64, ns	x^2_1=4.36, *p*=0.04*
Male	71.8	72.8	64.9		
Female	28.2	27.2	35.1		
Age (mean ± sd)					
Overall	31.6±11.3	32.7±12.1	37.3±11.0	$F_{1,631}$=1.15, *p*=0.28, ns	$F_{1,409}$=26.50, *p*<0.01*
Male	32.2±11.9	34.1±12.3	37.7±11.1	$F_{1,457}$=2.50, *p*=0.11, ns	$F_{1,281}$=16.10, *p*<0.01*
Female	30.2±9.8	28.9±10.7	36.4±10.7	$F_{1,172}$=0.56, *p*=0.45, ns	$F_{1,126}$=11.90, *p*<0.01*
Residency (%)					
Home state	95.7	92.6	100.0		
Interstate	2.9	2.4	0.0		
International	1.4	5.0	0.0		
				x^2_2=3.59, *p*=0.17, ns	x^2_2=263.52, *p*<0.01*
Experience (%)					
Novice	26.0	26.2	4.4		
Intermediate	20.3	23.7	15.5		
Experienced	53.7	50.1	80.1		
Trends					
Frequency current season				x^2_3=7.66, *p*=0.05, ns	x^2_3=4.14, *p*=0.25, ns
Visitation trend				x^2_2=6.07, *p*=0.05, ns	x^2_2=15.27, *p*<0.01*
Attitudes to changes				x^2_3=1.08, *p*=0.78, ns	x^2_3=21.56, p<0.01*

Comparison of on-site/club surveys

Whereas there was no significant difference between years in any parameter tested with on-site participants, all parameters were significantly different between on-site and club-based surveys sampled concurrently, except for visit frequency (Table 1). Differences between surveys included a higher proportion of females (seven percentage points) in clubs, compared to on-site respondents; mean age was higher; and most club-based respondents were experienced canyoners (80.1% versus 53.7%). In contrast, while <25% of the on-site respondents canyoned with a club, between 44.4-53.1% (depending on experience) club-based respondents canyoned as a club activity. Additionally, novices were more likely to canyon with a commercial group, and only experienced canyoned with friends/family. Frequency of percentage of experienced canyoners was similar between club and on-site respondents, although typically on-site respondents visited more frequently (35.2%) currently than in previous seasons compared to those (19.2%) surveyed on-site. A substantially higher percentage (18%) of club-based respondents than those surveyed on-site favoured immediate lowering of usage by management - not a popular option among on-site respondents.

Discussion

On-site survey responses were equivalent in both canyoning seasons but differed between on-site and club-based surveys. Canyoners presented with a different profile for all except current canyoning frequency. Since on-site response rate was conservatively estimated at >95%, we assumed this sampling instrument robust, and results from our first canyoning season's on-site survey were a valid basis to compare the club survey's similar-sized respondent base, sampled concurrently. No previous comparison between instruments appears to have occurred. Although many researchers have simultaneously collected data, typically it is pooled for analyses (e.g., mountain biking - Chiu & Kriwoken, 2003) although, unlike our data, club-based respondents were drawn from members of a club specifically focused on mountain biking. Even under these circumstances differences occur. For example, Goeft and Alder (2001) found that racers more frequently belonged to bike clubs than non-racers.

Survey of club membership offers benefits of ease, speed, and cost of obtaining data. Such benefits are increasingly enhanced with online methods, particularly web-based surveys. However, despite the increasing ease of surveying off-site, our data demonstrated that such information may provide erroneous results, particularly when contact is sought with emerging forms of adventure recreation without well-established profiles/behaviour. Despite the issues, accurate quantification of such data are required if land managers seek to relate environmental impacts with visitation levels (Burgin & Hardiman, 2012). The differences revealed between club/on-site surveys here are potentially important for managers when developing policy, and/or multi-use facilities, or even seeking to identify changing participation trends (Hardiman & Burgin, 2011).

However, since such intensive sampling is often unrealistic, survey methods should be carefully assessed for potential bias, and conclusions determined accordingly.

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Visitor monitoring with time lapse trail cameras

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Introduction

More and more protected areas are maintained and managed by non-profit organisations. In order to develop and implement e.g. specific management plans, knowledge about user groups, their behaviour and number are required.

The collection of this information and personnel for extensive surveys or mechanical counting devices are usually too costly for non-profit organisations. Therefore, they search for affordable alternatives to collect data on visitors and visitors' flow.

In a Lower Austrian part of the Wienerwald Biosphere Reserve, trail cameras have been purchased to document the user's activities for one year.

Method

To prevent vandalism and theft of the devices the cameras were installed as unobtrusive as possible in wooden nest boxes (mounting on trees) or in a moisture-proof junction box (mounting on a light pole). Moreover, to reach the widest possible view, the cameras were mounted at a height of about 4-6 meters. This, however, made the assembling itself and the on-going maintenance of the cameras difficult.

The cameras and camera housings had to be positioned in the boxes in such a way that changing of memory card and batteries could be done as fast as possible and without changing the set of the adjusted shooting angle and camera position (Figure 1).

Figure 1: Different boxes to camouflage the cameras (Czachs, C.)

The videos were recorded on SD cards (Secure Digital Memory Card) with a capacity of 32 GB (gigabytes). The camera settings - switch off at dusk, recording interval 20 seconds - allowed to save video files for a period of three to four weeks depending on a day-length and daylight. Therefore, the SD cards as well as the batteries were changed and replaced in the course of an interval of three to four weeks.

Challenges and problems

Difficult mounting conditions & intensive maintenance

The mounting height made it necessary to use an extension ladder as well as security rope. At least two people were necessary to perform the on-going maintenance. To avoid theft and vandalism, it was tried to do maintenance without attracting attention in the early morning hours (6:00 - 9:00 am). The necessary equipment was transported by car, so an inconspicuous maintenance was a challenge. The mere bearing of a ladder already attracted the attention of visitors.

Data- & picture failures

Problems with the cameras and the camera software occurred. Two out of six cameras had a 4-week data failure because of a software error. Data failure was also caused by fogging or freezing up of the camera lens or the housing.

Furthermore, snow on the branches of the trees or strong winds caused obstructions of the cameras view and the recordings of days or even longer periods could not be analysed.

Due to the maintenance intervals, view-obstructing objects were noticed only after one collection unit.

Data quality & evaluation

The legal framework in Austria provides that persons on the videos are not identifiable (Austrian Data Protection Authority, 2014). Therefore, the camera resolution had to be kept low.

Therefore, the identification of e.g. specific activities of visitors that took place in a greater distance to the camera proved to be difficult.

Furthermore, fogging of the lens and backlight caused problems when analysing the videos and so evaluation of the recordings took more time than expected. Often visitors and/or activities could be identified only after repeated watching.

Especially user groups that moved quickly (e.g. bikers) were in parts only visible as a "blurred shadow". By changing the recording interval of one camera from 20 to 10 seconds, we improved the recording quality of cyclists. This also meant that this camera had to be serviced more frequently (2-3 weeks intervals).

Theft & vandalism

Especially the camera located on a popular viewpoint was hard to disguise. Because of the widely visible position, the maintenance activities attracted curious glances. Furthermore, the camera had been stolen once and the replacement of the nesting box with a locked key box didn't prevent vandals from spraying colour on the camera lens.

Results and Discussion

Currently the collected video material is still in evaluation; therefore the results hitherto focus on the methods used.

In terms of acquisition and personnel costs the selected monitoring method provides a low priced alternative to conventional visitor monitoring methods like counting or mechanical counting devices.

The user activities can also be investigated for a longer period, which would not be feasible with personnel carrying out manual counts.

However, due to the limited storage capacity and battery life the cameras were intensive in maintenance. With some adjustments, such as larger memory cards and other power sources as e.g. batteries in combination with solar chargers, maintenance intervals could be extended. Though, with longer intervals of maintenance e.g. branches blocking the sight of the camera would be undiscovered for a longer period of time and data failures would be extended.

The quality of the gained data is dependent on the prevailing weather conditions and lighting conditions, the influence of the camera position and the recording direction is minor.

The reliability of the cameras regarding the recording of data is dependent to some extent on uncontrollable factors. Especially vandalism and theft play an important role in this context.

In conclusion, the method chosen is therefore suitable for carrying out visitor monitoring projects. In order to make the evaluation more efficient, the image quality should be as high as possible or allowed.

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Educational and recreational trails of forest ecosystems - New trekking possibilities in Plitvička jezera National Park

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With more than one million visitors every year Plitvička jezera National Park is one of the most visited places in Croatia and the most visited of eight national parks in this country.

There are around 70 km of marked trails in Plitvička jezera National Park. Beside 24 km of trails in a visitor system where visitors can use an electric boat and ride a panoramic vehicle, there are 14, 6 km of educational and recreational trails of forest ecosystem in a hiking trail "Medveđak" and 30 km of educational and recreational trails of forest ecosystems inside the "Čorkova uvala" trail (21 km) and "Plitvica" trail (9km).

It is impossible to have the full experience of the Plitvička jezera National Park unless one gets to know the forest ecosystems covering more than ¾ of its surface. The trails run through large forest complexes and mountain meadows with sightseeing points. The purpose of educational trails beside the outdoor recreation and active holydays is to provide visitors, passionate worshipers of nature, with the knowledge about the forests and forest ecosystems.

Educational boards are set up along the trails.

The natural old beech and fir forests as well as meadows are habitats for numerous animal species (bears, wolves, roe deer, red deer, lynxes, wild cats). No less interesting are the traces they leave.

Bird singing will additionally contribute to the atmosphere (woodpeckers and songbirds) and together with the wind rustling and the creaking of branches of continental trees as a trademark, it creates a genuine natural symphony with unique atmosphere.

Innovation in Rural Tourism (InRuTou) project - implications for visitor management in protected areas

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Tourism Development in Rural Communities

Many communities in rural and mountainous areas are facing challenges, including unemployment, depopulation, environmental degradation and social problems. According to the World Tourism Organization (WTO), rural tourism plays an important role in rural development, as it offers an opportunity for income generation, job creation (Sharpley, 2002) and economic diversification (Brandth & Haugen, 2011).

The 'EU Strategic Guidelines for Rural Development' comprise as the third priority: "Improving the quality of life in rural areas and encouraging diversification of the rural economy" (European Commission, 2006) and emphasize the diffusion of ICT as an important factor for the diversification of rural livelihoods (Galloway, Sanders, & Deakins, 2011).

As evidenced by research, the mainstream rural tourism development frequently does not empower rural mountain communities, as they are often excluded from the development processes (Sproule, 1996).

The project Innovation in Rural Tourism (InRuTou)

The project Innovation in Rural Tourism (InRuTou), funded by the Lifelong Learning Programme of the Education, Audiovisual and Culture Executive Agency of the European Union, was launched in January 2012 with the objective of providing new skills and competencies to rural tourism managers.

InRuTou aims at creating tourism capacities based on specific local necessities in the rural mountain communities of the Carpathians, the Alps and the Apennine, and testing them in the pilot areas in Poland, Romania and Ukraine, Italy and Austria. Overall, sustainable community-based tourism development shall be fostered through the project.

The planned InRuTou activities

- Promoting tourism as a development economic opportunity, leveraging on New Media for the creation, administration and promotion of rural tourism initiatives.
- Fostering community consultation processes, networking and destination governance through the formation of partnerships on local and regional levels.
- Creating a pedagogical training model for empowering rural communities in the establishment of tourism activities.
- Creating a set of Open Source digital tools and learning contents in open educational resources (OER) for European Rural Tourism Stakeholders
- Supporting participating communities in pilot tourism product creation, using the developed technological tools.
  - Training the local population to use created technological tools for local heritage promotion and local tourism product development
  - Increasing awareness of the local residents of the international, regional, national and local information resources and tourism – related processes and of ways to engage in them.
  - Training a number of rural innovators/opinion leaders to act as multipliers
- Promoting a comprehensive view of rural tourism attractions in the selected locations via online and mobile promotional e-tools
- Transferring the innovative methodology and tools to wider areas of the EU and the Neighbourhood.

Current project status

Community consultations have been held in the pilot areas and questionnaires conducted. Results of the background analysis have shown that rural communities are facing distinct challenges and thus, need to gain capacities in specific competence fields. The results are used to construct the pedagogical training framework and develop electronic modules, which will be used to train the local tourism actors in the participating communities.

The role of research in the project

Research plays an important role in several aspects of the InRuTou project: in the background analysis, used to adjust the training to the needs of the participating communities; in the evaluation of the project results, and in presenting the project to academic community, in the fields of tourism development, vocational and educational training and e-learning, to promote further findings in these spheres.

Protected areas and rural tourism development

One focus of sustainable regional development efforts, which also plays a role in tourism attraction, is protection of biodiversity, natural resources and unique natural landscapes via establishment of protected areas (PAs).

PAs can facilitate preservation of cultural heritage and traditional land use, provide alternative opportunities of socio-economic development, and support income – generation activities, such as tourism (e.g. Dredge & Thomas 2009), in the surrounding local communities. These perspectives could mean that PAs could provide the platform of cooperation, knowledge and experience sharing in the field of rural tourism development. If managed accordingly, this could help prevent land use-related conflicts between local inhabitants and PAs.

Protected areas in the InRuTou project

Protected areas are involved in the InRuTou project in most pilot areas, and in several ways: by participating in community consultations and supporting project implementation.

The potential impacts of the InRuTou project on Protected Area Visitor Management

Although protected areas are not the main focus of the InRuTou project, they are considered as potential project beneficiaries, as part of the local communities. As such, PAs could profit from the project, including in the field of PA visitor management, and specifically by attracting more visitors.

PA staff could act as the local tourism innovators/opinion leaders, or cooperate with other local organizations/individuals assuming this purpose. As such, they could be trained by the open source courses, developed by the InRuTou project, and use the electronic tools to create and advertise innovative tourism offers. Such offers, combining various activities within the PA with the local community attractions, could interest a more diverse range of visitors.

The tourism offers could also be developed in accordance with each protected area's visitor rules and restrictions.

In addition, participation of the PA in the community cooperation process, which forms the basis of *InRuTou*, could increase awareness among the local population about the PA itself, leading to increased local visitors, and other advantages for PA management.

The role of research in the process

The above process can be facilitated by research focused on the impacts of the training on PA staff and their competencies in tourism development and visitor management. A participatory study with PA staff could contribute to developing an additional module geared towards PAs and addressing visitor management specifically.

The poster will present the project, partners, and process to-date, with a focus on participating communities and protected areas and their cooperation in the local tourism development.

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Combining GPS-tracking and graph theory for evaluating the functionality of hiking trails in recreational areas

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Introduction

Areas of high natural value belong to the most attractive recreational destinations. Balancing needs of visitors and site capacities is considered to be the major challenge for planners and managers of such amenities (Bell, 1997). Comprehensive understanding of human spatial behaviour and the actual use of recreational infrastructure can support effective planning of outdoor leisure settings. Strategic allocation of infrastructure and provision of information are important tools to manage the direction of movement as well as recreational experience of visitors.

The aim of this paper is to present a new method of evaluating the functionality of a trail network combining GPS-tracking and graph theory. The main focus is placed at the assessment of the overall trail connectivity as well as at the relative importance of network nodes, as key locations affecting way finding of recreationists.

Study Area

The study is based on empirical data collected in the Lobau recreational area in Austria. The Lobau is the westernmost part of the Danube Floodplains National Park (Nationalpark Donau-Auen) that lies inside the city limits of Vienna. This respectively small recreational area (2400 ha, 2km x 10km) attracts approximately 600 000 visits per year (Arnberger *et al*. 2000). Hiking and cycling are the two major recreational activities practiced in the area. The total length of paths and trails in the Lobau is 130 km.

Methods

Two types of data were used in this study: the physical structure of a trail network and a record of trip itineraries (GPS tracks) of recreational area visitors. The trail network has been digitized using ArcGIS software and verified using GPS during a field-work. In order to investigate the actual use of trails in the Lobau a GPS-tracking approach has been applied (Taczanowska *et al*., 2006). 482 trip itineraries (GPS tracks) of individual visitors were collected during 4 sampling days in the case study area. 60 GPS devices (GARMIN e-Trex) were distributed at the entrance gates among the National Park visitors.

Data analysis consisted of five steps: 1) Pre-processing of GPS data; 2) Creating the structural network (undirected graph); 3) Creating the functional network (directed graph); 4) Calculating network connectivity indices; 5) Calculating the importance of network nodes (Measurements: Input degree; Output degree; Input Closeness; Output Closeness; Betweenness). The pre-processing of the collected GPS data as well as the analysis of the structural and functional trail networks have been done using Matlab modelling environment. Some specific network properties such as parameters describing the importance of nodes and the graphic representation were carried out using the Pajek (version 1.28) software. Figure 1 shows an example of a directed graph based on a visitor's trip itinerary. The directed graph for the entire Lobau area is composed of all accurate GPS-tracks (N=314).

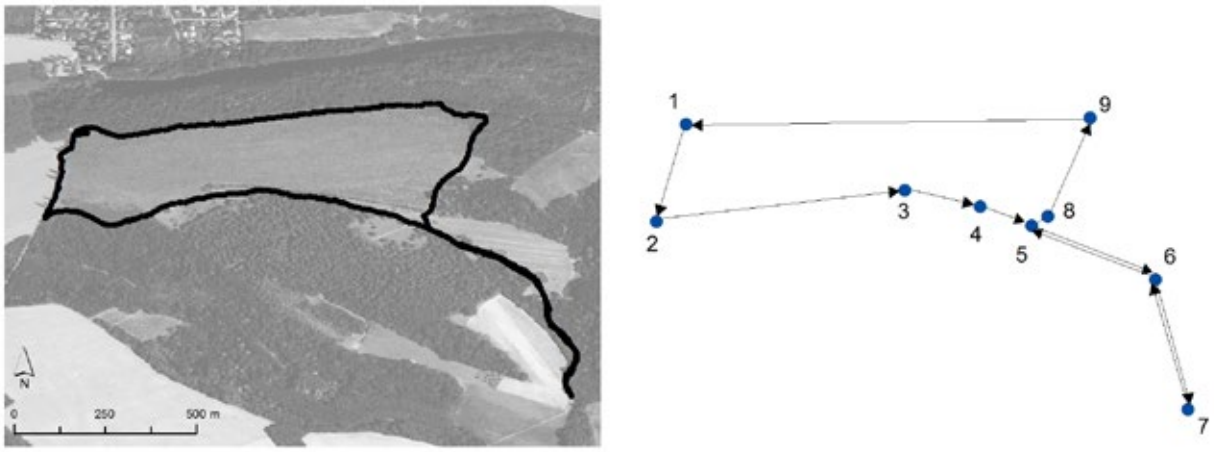

Figure 1. Example of a directed graph based on a visitor's trip itinerary (GPS track) in the Lobau area.

Results and Discussion

Basically, it can be observed that the network of the existing paths in the Lobau has a high connectivity. It belongs to the delta network type (Taaffe & Gauthier, 1973), characterized by a high density of linkages relative to the number of nodes. Such structure enables an efficient flow of visitors through the network, offering many route choice possibilities. However, the investigated trail network has not been evenly used by the area visitors. Due to a good access to the Lobau in the northern and western part of the area visitors tend to use trails located close to major entrance points. The south-eastern part of the Lobau ("Untere-Lobau") is less frequently used.

The calculated node centrality measurements show clear differences in the importance of network nodes. "Output and Input degree" parameters reflect the intensity and the direction of use at each node location. There is a clear disproportion of use between the north-western and south-eastern parts of the Lobau. The directions of use are balanced at most locations, which means that the nodes are used in both directions and there is no dominant "collector" or "sender" nodes in the Lobau area.

From the management point of view the "Betweeness" parameter might be especially valuable. Nodes lying on the communication paths between different area locations are regarded to be important. The higher the betweenness value, the more paths may cross a given node. The result for the Lobau network shows that in this respect the most important nodes are located in the northern and central part of the area.

Conclusions & Outlook

The main contribution of this study is combining GPS-tracking and analytical methods based on graph theory to better understand the structure and the function of a trail network in an outdoor recreational site. Identification of the important network nodes can be supportive while planning locations of sign-posts, on-site maps, interpretative-trails or resting places. Furthermore, knowledge concerning connectivity parameters helps estimating whether the trail network enables effective flow of visitors to the desired destinations.

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"Holidays for Sustainability" – case study about education for sustainable development in a Bulgarian Nature Park as a form of tourism

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The central objective of the education for sustainable development is to shape competences and this needs active learning. Bulgarian nature parks, IV and V International Union for the Conservation of Nature protected area categories, are models of sustainability where lessons learnt can be experienced. For such an experience, the trainees should first travel to and stay for a while in the protected area, which is in fact a form of tourism. Educational activities as well as tourism are two of the three management goals of the Bulgarian nature parks, which are often understood and pursued separately. The project "Holidays for Sustainability" is an example for reconciling both protected areas' management goals – education and tourism. Moreover this project is based on the education for sustainable development concept and contributes to the acquiring of competences. It provides know-how for a modern approach of educational tourism in the Bulgarian nature parks.

The Problem in Bulgaria

The intellectual power of Bulgaria is strongly concentrated in the capital, which results in an empty rural countryside. Mass tourism and big hotels invade the nature, while alternative tourism and traditional environmental friendly guest houses in the villages are not attractive for young people. The connection between citizens and nature, citizens and villages fades away. Furthermore, the Bulgarian school does not educate environmental awareness and sustainable lifestyle among the pupils. There are seldom classroom and extracurricular lessons, exercises and teaching experience for applying education for sustainable development (ESD) in and outside the school. Officially, the Nature Park Administrations are responsible for regional development in a sustainable way, for developing alternative tourism and for conducting educational activities.

The Research Question

How the local communities could be supported through tourism in nature parks and at the same time raise environmental awareness among teenagers achieving education for sustainable development goals?

Goal and Objectives

This case study aims to find a solution for the identified needs in Bulgaria investigating a possible approach for developing forms of cooperation between alternative tourism and ESD in the Bulgarian nature park Vrachansky Balkan.

The research also aimed to discover a way to encourage a new attitude towards the traditional Bulgarian village and the surrounding nature by young people from the city and to extend and deepen the knowledge on sustainable development in the dialogue between young people from the capital and young people from rural regions in Bulgaria. Another objective was to discover a way to raise high-school teachers' knowledge in sustainable development and train them in non-formal education methods. Also, to find a way to develop, illustrate and promote the potential of an alternative tourism, combined with aspects of ESD; to encourage people living in rural regions to explore concepts of alternative tourism and to manage environmentally friendly guest-houses.

Target groups

The target groups of the case study are young people, teachers and local people.
Teenagers from the capital and from rural areas were addressed, because this is the age when young people develop their own value system and this provides an opportunity to make them sensible of environmental issues.
High-school teachers from Sofia and from the rural regions of Vratsa and Montana, who were interested in environmental education and explore possibilities of using active learning methods, were involved.
The rural population of the Vratsa region was included for widening their perspectives and raising awareness about the potential of sustainable development and alternative tourism.

Method of Research - The project "Holidays for Sustainability"

The practical experience based on the project "Holidays for Sustainability" is used. Results are analyzed and discussed for answering the research question.
The project was implemented by a Bulgarian NGO in partnership with the Administration of Nature Park Vratchansky Balkan, 3 NGOs, 5 villages' mayoralties and 4 culture houses.

During the school holidays of 2013, six weekly experiential learning oriented trainings were organized in 5 different villages located in the "Vratchansky Balkan" Nature Park. The trainings involved 139 students, accompanied by 22 teachers from different secondary schools from Sofia and Vratsa region and also 12 other interested trainers. The number of participants was higher than expected and 2 extra trainings had to be organized.

Reaching the ESD goals

Trainings focused on sustainable development on global, local and individual level and the program was based on active learning methods. The focus was on practical exercises. Participants had to get familiar with local characteristics – nature, culture, traditions. They elaborated 27 sustainable concepts and strategies for regional development, specific for each village, which were presented in final *Open door* events for the local people in each village. The young people from the trainings also took part in the sustainable local initiatives with creative activities and small own projects.

A Handbook with the educational methods used during the seminars was produced and presented as a tool for doing ESD, which supported the work of trainers.

Alternative tourism aspect

The participants were accommodated in villagers' houses. About 15 houses were involved and encouraged to turn into eco-friendly guest-houses. More than 25% of the average inhabitants of the villages visited the *Open door* events, thus local communities have become more sensitive to sustainability. Local infrastructural initiatives suggested by the local communities took place. They aimed to humanize certain places through sustainable practices and make the villages nicer for inhabitants and visitors – eco trails, information plates and signboards, public fountain taps, solar batteries for public lighting, etc.

Discussion and analysis of results

The qualitative and quantitative evaluation of the trainings was based on personal interviews and questionnaires. The educational activities were useful for 95% of the teachers and for 90% of the students. More than 90% of all participants mark them as very good and excellent and 75% said that they learned many new things. The trainings would be recommended to others from 98.5% of the participants. Teachers shared that they were impressed by the applied active learning methods. Some of the favorite activities of the students were the outdoor activities, the educational games and the practical work. Fundamental shaping competences were defined for the trainings and each participant chose from a list of 3, which he/she acquired during the training. The competences, chosen by the respective percentage of participants showed that all defined shaping competences were well promoted during the trainings and it can be seen on the Figure below.

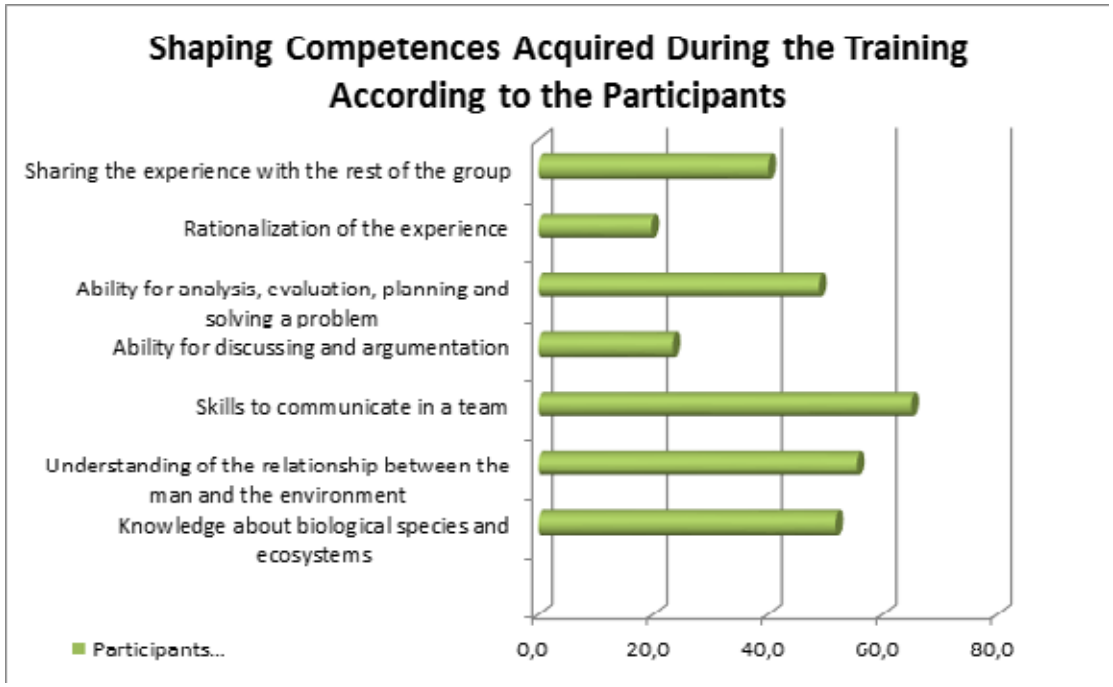

Figure: Shaping competences acquired during the trainings according to the participants.

Conclusion

The results from the project "Holidays for Sustainability" show that organizing multi-day experiential trainings for young people in protected areas is a modern form of tourism, which contributes to the education for sustainable development, but also supports local economies and helps preserving nature, traditional culture and values.

It fills the gap of information and practice in the high school curriculum, is an example for ESD activities, promotes the educational instead of mass tourism, and creates visual and teaching materials for sustainable lifestyle. ESD is applied on different levels – youths, teachers/trainers and local communities. The project achievements are thanks to the effective relations between the local and national partner organizations.

It was nominated as an Innovative practice in Bulgaria and despite its limited range it could be a successful approach applied in other nature parks. The challenge is to multiply this good model for educational tourism in Bulgaria.

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